At Risk Mental State
A comparison between prisoner and community self-report groups

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Abstract

Background: Previous research has shown a high prevalence of psychosis in the prisoner population. The aim of this study was to examine feasibility of introducing an early detection service into a prison setting. It is the first study to examine prevalence and correlates of At Risk Mental State in a prison population, and to carry out a comparison between prisoners and a help seeking male community population.

Hypothesis: We hypothesised that prisoners with an At Risk Mental State would have higher rates of i) social exclusion, ii) childhood adversity iii) substance misuse and iv) Black Ethnicity compared to prisoners without an at risk mental state and compared to their community counterparts.

Method: A two stage procedure was used. New receptions meeting inclusion criteria were screened. Those that screened positive and 7% of those that screened negative underwent further assessment to establish they met criteria for being at high risk of psychosis. In addition, we collected data on socio-demographic variables, childhood adverse life events, alcohol and substance misuse, current criminal justice system information, and history of self harm and attempted suicide. The community sample was comprised of a subset of help seeking males who had sought help for mental health issues from various sources and were consequently assessed by the community early detection team.

Results: Of 891 prisoners who were screened, 44% screened positive. We identified a prevalence of 5% at risk mental state and 3% first episode psychosis as well as a large proportion of prisoners with other mental disorder. The prison group did not differ greatly from the community group but did differ from the prison group that were negative at both screen and at second stage assessment.

Conclusion: An at risk mental state service in a prison is both feasible and useful, in particular if the remit of identification is broadened to other mental disorder as well as the psychotic spectrum.

Acknowledgements

I would like to express my thanks firstly to the participants of the project, but also more broadly to the prisoners of HMP Brixton. Those who participated were required to share personal information and we are grateful that they were willing and able to do so. More broadly, I often approached prisoners on the wing to find out information about the general workings of the prison and they were more often than not happy to share information.

A thanks also to the staff of the prison who did more than just tolerate having a researcher around the place, but were actively helpful in small but significant ways that eased some of the challenges of working in the prison setting. A particular thanks to Officers Lavary and Shoulders who were required to find and bring across participants from their locations to healthcare. They were also involved in the dice throwing saga for randomisation purposes. Without their help, we would not have achieved the number of second stage assessments that we did.

I would also like to express my gratitude to the other healthcare services of HMP Brixton, in particular the Outreach Team, in whose office I was based for the entire project and who were an enormous source of support and information. Also the Primary Mental Healthcare Team for the same.

The OASIS team in the community from whom I learnt so much about at risk mental state assessment and who showed enthusiasm for this project from the onset are in my opinion a first class team and it is a privilege to work with them.

I am deeply grateful for the excellent supervision I received during the course of this PhD from my supervisors Tom Craig, Lucia Valmaggia and Janet Parrott. Lucia's complete and ongoing commitment to the prison work from the beginning was crucial in getting the project off the ground and taking to the stage it is at now, with a service being introduced. Tom's wisdom in thinking through some of the methodological issues has provided the best training education. It's been an honour to work with such skilled and knowledgeable people.

Lastly a thanks to family, friends and colleagues who made the process that much easier with their support, encouragement and humour.

Finally, I would like to thank the funders of the project, Guys and St Thomas' Charity for their financial support and their interest in the project.

My role in this project

I came to be involved in this project after being approached by a Community Consultant Forensic Psychiatrist, Dr David Ndegwa, who was interested in introducing the OASIS service to the prison. My interest in prison mental health had been firmly established when working as a researcher on the National Evaluation of In-reach Study (OHRN, 2009). Following the discussion with the Consultant Forensic Psychiatrist, I approached Professor Tom Craig (lead researcher in early intervention in my department) to discuss the project, which in turn led to the involvement of Dr Lucia Valmaggia and Professor Philip McGuire of the OASiS team, as well as Dr Andrew Forrester, Consultant Forensic Psychiatrist in HMP Brixton. I attended all the meetings at which the project was discussed, contributing to the selection of assessment tools and advising on the procedure of recruitment in the prison setting. Dr Valmaggia led on a grant application from Guys and St Thomas' Charity who kindly funded the project. She also completed the NHS ethics form, while I completed the prison ethics form, and the consent and information sheets. I carried out almost all screening on the project, and in conjunction with Drs Toby Winton-Brown (senior registrar from OASIS) and Helen McGuire (senior registrar in the prison) carried out the second stage assessments to determine criteria for meeting at risk mental state. I also carried out all data entry and analysis.

Preface

The aim of this study was to establish feasibility of introducing a service for early detection of psychosis into a local male prison in south London. Studies have shown that there are high rates of psychosis among prisoners (Singleton et al., 1998; OHRN, 2009) and that these are substantially higher than the general population (Brugha et al., 2005). A series of government reports starting in the late nineties identified concerns over the healthcare of prisoners, notably a poor standard of services, a lack of services and the isolation of clinicians working in these environments. At the time, the prison service including prison healthcare fell under the remit of the Home Office. The government responded by acknowledging that 'prisoners should have access to the same range and quality of services as they would have outside prison'. This became enshrined in the principle of 'equivalence of care' and has since provided the bedrock for prison healthcare services and policy developments. It was the conceptual cornerstone of the transfer of responsibility for healthcare from the prison service to the NHS which began in 2001 and completed in 2007. The first prison mental health teams (known as in-reach) in England and Wales were rolled out in 2001/2 (Brooker et al., 2005), with the service expanding across the prison estate in the following years (Seddon, 2007). Since then there has been little mental health service development in prison (Brooker et al., 2007). Meanwhile, in the community, other models of care have been established, among which are services for people experiencing their first episode of psychosis. These early intervention services were founded on the basis of research that pointed to a link between duration of untreated psychosis (DUP), duration of untreated illness (DUI) which included the prodrome, and poor prognostic outcome.

The concept of early intervention was extended to early detection in which individuals were detected in the pre-psychotic or prodrome phase and the course of the illness interrupted before threshold level for psychosis was reached. However, early detection has been controversial from the outset. The threshold level for psychosis is effectively the stage at which to intervene with treatment. Criteria for the point at which an individual receives a diagnosis of psychosis and should be offered interventions is laid out in the

diagnostic manuals (Diagnostic and Statistical Manual for Mental Disorders–IV-TR; International Classification of Diseases–10). But the validity of the criteria has long been criticised for its lack of objective evidence base, its reliance on subjective judgements by clinicians and the assumption that the threshold criteria clearly demarcate those who are unwell from those who are not (Bentall, 2006; Boyle, 2002; Maj, 1998). The evidence that psychotic like symptoms are distributed on a continuum throughout the population (Strauss, 1969) and that they are expressed in differential rates according to cultural background and age (Myers, 2011) raises questions about labelling individuals as being at risk of psychosis on the basis on such experiences. Nevertheless, there is support for the notion that psychotic like experiences which persist over time incur an increased risk for psychosis (Poulton et al., 2000; Hanssen et al., 2005). The indications are that the relationship between psychotic like experiences and the development of psychosis is mediated by other complex factors relating to other psychopathology (e.g. mood), psychological elements (e.g. coping skills) which often emerge against a background of developmental difficulties (e.g. social and affective deficits dating from childhood), as well a stress vulnerability model (Zubin and Spring, 1977). Furthermore, the known social risk factors for psychosis (e.g. childhood adversity, social exclusion, urbanicity) are also correlated with the at risk mental state for psychosis (Fisher et al., 2012; Thompson et al., 2013; Fusar-Poli et al., 2010).

In order to address the criticisms of labelling individuals as being at risk of psychosis, with the associated anxiety and stigma, early detection services established a policy of working only with individuals who have sought help via their GP, other agencies, or via self referral. In this way, the services can target people who are distressed enough to seek help and actively engage with treatment. However, this also means that the current understanding of individuals at risk of psychosis is based on a specific profile of individuals who are help seeking, so it is unclear whether the profile applies to other populations. Prisoners are a population that despite high levels of mental and physical health problems do not routinely access NHS services outside prison (Harty et al., 2003; Department of Health, 2002), but have an elevated use of healthcare services when in custody (Marshall et al., 2001). Many of the socio-

demographic risk factors for psychosis are the same as those for offending (Williams, 2012a, Farrington and Welsh, 2007). Prisoners in local prisons such as the study site tend to have high rates of mental disorder and substance misuse (Singleton, 1998, OHRN, 2009). Many will require a detoxification regime on entry to custody (National Treatment Agency for Substance Misuse, 2012). The early days of custody are recognised as a highly stressful time, and this may increase the risk in already vulnerable individuals. Furthermore there is little understanding on the impact of prison on the course of psychosis. There is no information on how many people develop psychosis in prison, or how many first come to the attention of services in prison.

The project came about as a local response to the transformation of healthcare services within the prison service and the NHS mandate to deliver the principle of equivalence of care. Outreach and Support in South London (OASIS) is an early detection service within the South London and Maudsley Trust. The trust had become the mental healthcare provider in a local London prison for adult males and there was recognition that there was room to improve mental health service provision in the prison. The aim of the study was to explore the possibility of introducing the OASIS service into the prison. The objectives were to determine prevalence of at risk mental state among prisoners, and to understand the needs of prisoners with an at risk mental state compared to those without and to the community help seeking group.

Chapter One of this thesis will begin by setting the context within which the study was carried out. The key policy documents which led to major healthcare change within prisons will be outlined, along with the studies of prevalence of mental health disorder among prisoners which led to the policy developments. There will be a summary of risk factors for offending which will also introduce the concept of 'imported vulnerability'. An overview of the literature detailing the care pathway for mentally ill prisoners is reviewed: screening, introduction and role of mental health teams in prison, inpatient wings, and transfers to NHS hospitals.

Chapter Two will give a summary of the research to date on the known social risk factors associated with psychosis. There is a large body of literature for each area discussed as well as other biological risk factors, but the aim of this chapter is simply to provide the reader with an up to date account of the status quo for factors which can be examined in the context of this study.

Chapter Three will discuss some of the diagnostic issues around psychosis, as defined in the diagnostic manuals. Criticisms of construct validity have been persistent over a number of years with alternative views of understanding psychotic symptoms as presenting along a continuum of distribution within the general population. The findings from investigations into early characteristics of individuals who have gone on to develop schizophrenia are also outlined. The aim of this chapter is to lay the ground work for the specific discussion around prodrome in the next chapter.

Chapter Four will lay out the background to the evolution of At Risk Mental State Services and Research. Beginning with an overview of the establishment of Early Intervention Services following findings linking duration of untreated psychosis with poor outcomes, the chapter then goes on to briefly describe the early literature on psychosis prodrome from the early half of the 20th century. Findings from retrospective studies are reviewed before the At Risk Mental State literature is addressed. This literature encompasses the Basic Symptoms concept, the Ultra High Risk Concept, the conceptual and methodological issues around these and their measurement, concerns around transition rates, as well as outcomes of those individuals who meet the ARMS criteria but do not make transition. A final section discusses the question of applying ARMS criteria in a prison setting.

Chapter Five, a methodology chapter which will lay out the details of the samples, assessment tools and procedures used for the both the prison and the community studies.

Chapters Six to Nine consist of results sections, each with their own discussion section. They comprise of: the comparison of prisoners who were positive at screen compared to those who were negative; an examination of the sensitivity and specificity of the screening questionnaire used; and finally, a comparison of prisoners who met criteria for ARMS with a sample from the help seeking community service.

Chapter Ten will provide a final overall discussion and conclusion of the thesis. It will summarise the findings, discuss the strengths and limitations of the project, outline possible implications of early detection in prison in terms of further research, implications for the legal process, and impact on the development of services. It will also provide an update on the development of a service since this project ended.

Chapter 1: The Mental Health of Prisoners

This chapter will address the context of the study in terms of policy, prevalence of psychosis and care pathway in prison.

1.1 Policy

In 1996, a seminal report was published entitled 'Patient or prisoner? A new strategy for healthcare in prisons' (Her Majesty's Inspectorate of Prisons, 1996). The opening statement was 'To consider healthcare arrangements in Prison Service establishments in England and Wales with a view to ensuring that prisoners are given access to the same quality and range of healthcare services as the general public receives from the National Health Service' (pp.1). Subsequently known as the 'principle of equivalence' of care, this statement has since provided the mandate for prison healthcare services and policy developments. At the time, responsibility for healthcare in prisons lay with the Prison Service. The 1952 Prisons Act and Prison Rules made a statutory requirement for provision of healthcare for prisoners, making references to primary, physical and mental healthcare. The Prison Service came under the remit of the Home Office and the financial responsibility for prisoners' healthcare therefore lay with that ministry and came out of the Prison Service economic budget.

Patient or prisoner was followed by three more reports: The Provision of Mental Health Care in Prisons (Health Advisory Committee for the Prison Service, 1997); The Future Organisation of Healthcare in Prisons (Her Majesty's Prison Service and NHS Executive, 1999); and Changing the Outlook (Department of Health, 2001a). Together they laid the groundwork for the re-structuring of healthcare services in prisons. A series of recommendations that resulted in the transfer in commissioning responsibility for healthcare from the Prison Service to the NHS which began in 2003 and completed in April 2006. The feasibility and logic of the Prison Service being a separate healthcare provider to the NHS was questioned and the attempted replication of the NHS role by the Prison Service was denounced as ineffective and inefficient (Her Majesty's Inspectorate of Prisons, 1996). They further criticised standards of healthcare reporting in

as far as services were organised in terms of volume, range and quality did not meet prisoners needs (Department of Health, 2001a); that prison healthcare was reactive instead of pro-active (Her Majesty's Prison Service & NHS Executive, 1999); staff were isolated from NHS colleagues and healthcare developments (Her Majesty's Inspectorate of Prisons, 1996); and that the poor lines of communication resulted in confused accountability (Her Majesty's Prison Service & NHS Executive, 1999).

'Patient or prisoner' (Her Majesty's Inspectorate of Prisons, 1996) made the explicit recommendation for the NHS to take over commissioning responsibility of healthcare, and this was re-iterated in the reports that followed. Further recommendations were to reduce the number of prisoners using the inpatient healthcare beds in prison. This would be made possible by the introduction of mental health in-reach teams into prisons (Department of Health, 2001a). These would be modelled on Community Mental Health Teams and would work within the main locations of the prisons supporting prisoners to remain within the 'community' of the prison rather than going to inpatient centres. It was proposed that the quality of care in prisons should be guaranteed via the National Service Framework (NSF; Department of Health, 1999) and through evidenced based guidelines. Further proposals were put forward to enhance continuity of care from improved screening at reception (Her Majesty's Prison Service & NHS Executive, 1999); to the introduction of the Care Programme Approach for mentally ill prisoners being released from custody (Her Majesty's Prison Service & NHS Executive, 1999; Department of Health, 2001a); and in all reports was the concern over delays in transfer of mentally ill prisoners to NHS facilities. The reports laid the groundwork for the NHS to take over responsibility for prisoners' health from the Prison Service.

In 2009, Lord Bradley published his review 'People with mental health problems or learning disabilities in the criminal justice system' (Right Honourable Lord Bradley, 2009). He advocated for:

- diversion of mentally ill people away from the criminal justice system at the earliest possible opportunity

- better communication between criminal justice system agencies and health services
- more involvement of non-health agencies (e.g. housing), including statutory and third sector providers to help meet the needs of mentally ill people in the criminal justice system, in particular in prison
- continuity of care across the offender pathway.

The prison population is currently at its highest ever (almost 84,000, all but 4000 are male), and there has been an acknowledgment both in recent policy initiatives that addressing the mental health needs of those who come into contact with the Criminal Justice System is fundamental to reducing the prison population (Right Honourable Lord Bradley, 2009; Kenneth Clarke, Secretary of State for Justice, speech to the Conservative Party Conference on 4th October 2011). The current Secretary of State for Justice, Chris Grayling, when taking up post in September 2012, acknowledged in his keynote speech (9th October 2012) the socially disadvantaged background of prisoners and the high rates of mental health problems which present particular challenges when addressing the needs of this population. His stated aims within the prison system are to focus on reducing re-offending by supporting drug rehabilitation programmes, and providing more purposeful activity with the potential to lead to employment on release. However, he has also explicitly acknowledged that these aims must occur within a financial context of reducing costs (Speech 20th November 2012). No detail was given on how this would be achieved.

1.2 The Prison System

There are currently 139 prisons in England and Wales holding a total of 83, 750 individuals men, women and children (week ending Friday 7th June 2013) of which 79, 936 are male (https://www.gov.uk/government/publications/prison-population-figures). This section will describe the organisation of adult male prisons. Young Offender Institutions and female prisons are organised in a slightly different way. Adult male prisons hold men aged 21 and over. The prisons are categorised

according to security (Category A to D) and function (remand or training). Following conviction prisoners are assigned a security category based on an assessment of their danger to the public as well as their risk to escape. Categories are A to D:

- Category A - Prisoners whose escape would be highly dangerous to the public or the police or the security of the State and for whom the aim must be to make escape impossible[1].
- Category B – Prisoners for whom the very highest conditions of security are not necessary but for whom escape must be made very difficult.
- Category C – Prisoners who cannot be trusted in open conditions but who do not have the resources and will to make a determined escape attempt.
- Category D - Prisoners who present a low risk; can reasonably be trusted in open conditions and for whom open conditions are appropriate.

Local prisons (also known as remand prisons) serve the courts and hold prisoners who are awaiting trial or serving short sentences (usually 2 years or less). All prisoners will first go to a local prison from court before going to other establishments. The site used for this study was a local prison, deliberately chosen to capture the population who are coming to prison from the community rather than being transferred from other jails where they will have had an opportunity to adjust to being in custody. These prisons take 'new receptions' (individuals who have been in prison before but are coming in for a 'new' term) and also 'first receptions' (individuals coming to prison for the first time). Local prisons have the highest turnover of any type of prison. Approximately 15% of the prisoner population is made up of remand prisoners. Once a prisoner is sentenced, if they receive a sentence of longer than two years, they will be sent to a training prison.

[1] Prisoners thought to be particularly high risk are assigned Category A while on remand to ensure adequate security measures are taken whilst they are in prison awaiting trial and when they are transported to court.

Closed training prisons provide a range of training and education facilities for Category B and C prisoners. They also provide psychology programmes to address offending behaviour. Category A prisoners also go to similar types of prisons but which have a higher level of security and are known as the dispersal prisons. Open prisons hold Category D prisoners who are deemed low risk for danger and for escape. They also hold prisoners who have worked their way down the categories of prisons and are now nearing the end of their sentence. Category D prisoners often work in the community, leaving the prison for the day and returning in the evening (http://www.justice.gov.uk/downloads/publications/inspectorate-reports; www.justice.gov.uk/.../psi-40-2011-categorisation-adult-males.doc*)*

1.3 Psychosis among male prisoners

There have been various studies of the prevalence of psychiatric morbidity among the prison populations at both international and national level. Prevalence of psychosis in male prisoners has been reported at 8% (overall for remand and sentenced) in an Australian study (Butler and Allnutt, 2003), 3% in remand and 2% in sentenced for schizophrenia in a New Zealand prison (Brinded et al., 2001), 4.7% in a South African study of remand prisoners (Naidoo and Mkize, 2012), 3.8% in remanded and 0.8% in sentenced Irish prisoners (Curtin et al., 2009), while in the UK, the last study found an overall rate (both remand and sentenced) of 9% in male prisoners (Offender Health Research Network, 2009). Generally, rates are higher in remand populations than sentenced populations. The variation in rates is due to different measures, but also because of the care pathways in each country (availability of diversion services etc). A systematic review of the international literature by Fazel and Danesh (2002) based on 49 relevant surveys involving 19,011 prisoners found a prevalence rate of 3.7% (95% CI 3.3-4.1) of psychotic illnesses. An update on this review based on 74 studies involving 30, 635 prisoners found a similar prevalence rate (3.6%, CI 95%, 3.1-4.2) of psychotic illnesses in the prison population worldwide (Fazel and Seewald, 2012). The authors found no differences between rates in the remand compared to the sentenced population, but they did find a difference between high income and low and middle income countries with the latter having a significantly higher prevalence than the former (5.5% versus 3.5%).

The review for this chapter will focus on the studies carried out in England and Wales, that include adult males (aged over 21 years), and report information on psychosis. Studies in which there were only female participants, or only young offenders, or that did not include data on psychosis rates were excluded from the review. The search terms used were a combination of the following: prevalence, rates, psycho$, prison$, mental, illness, disorder and psychiatric. Search bases used were: Embase (1980- Feb 2013), Ovid Medline (1948- Feb 2013), PsycINFO (1806- Feb 2013), Journals@Ovid Full Text (Feb 2013), Books@Ovid (Feb 2013). In addition, reference lists from articles and book chapters were searched for further relevant literature. Six studies were identified. They are summarised in Table 1.

One of the earliest studies on prevalence of mental disorder among the prison population was carried out by West (1963). West sought to establish the level of mental disorder among a group of 100 repeat offenders. They ranged in age from 30 to 80 years, 44 years being the mean. Information was sought from social records, and all but four of the men underwent a psychiatric interview. In addition, the author carried out home visits with a view to obtaining information from a relative. The study reported a lifetime psychosis prevalence of 10% with a further 16% having been admitted to hospital for psychiatric treatment or discharged from the armed forces on psychiatric grounds. The author concluded that the sample was not especially prone to psychosis, rather that they were more likely to be detected due to being incarcerated. His belief was that high rate of disorder was due to high detection rather than high prevalence per se of mental disorder.

Gunn et al. (1991) surveyed the mental health of a randomly selected sample of sentenced male prisoners across 16 prisons out of a possible 120 at the time. The authors state that both the prisons and participants were chosen to be representative of the total prison population in terms of length of sentence and type of prison, but do not give details on how this was achieved. The sample which comprised 1365 adult men and 404 young offenders made up 5% of the sentenced population at the time.

Prisoners underwent a semi-structured interview designed especially for the project and collateral information was sought from the inmate prison criminal and medical files, as well as NHS records if previous treatment had been reported. They found mental disorder in 37% of the sample, with a 2% prevalence rate of psychosis. The authors did not report a breakdown of rates by type of institution or prisoner (adult or young offender). They concluded that prevalence of psychosis among prisoners was 'comparable to that in the community populations', but noted what they referred to as 'the limited treatment options' in prison, and the fact that 2% of sentenced prisoners represented a large number of unwell individuals in the prison system.

Five years later, Brooke et al. (1996) published the results of their study to establish prevalence of mental disorder among unconvicted male prisoners. They assessed 750 men, 206 (27%) from young offenders' institutions and 544 (73%) from thirteen adult male prisons. The sample was a randomly selected cross section of the population with prisoners chosen from a list of remanded prisoners organised by location in the prison. The authors used a semi-structured interview to obtain personal, demographic and psychiatric history as well as evidence of personality disorder which had been designed for the study and piloted. In addition, all participants underwent the Lifetime version of the Schedule for Affective Disorders (SADS-L; Endicott and Spitzer, 1978) to assess concurrent validity of their own interview. Collateral information was also taken from prison disciplinary and medical records. The authors found a mental disorder prevalence rate of 63% (N=469) , 5% of the 750 had psychosis. Drug or alcohol misuse formed the largest diagnostic group (38%), followed by neurotic illness (26%). They had an 18% overall refusal rate and ran comparisons on 25 demographic and clinical variables (of which no details were given) between those who refused and those who participated and found no statistically significant differences.

The same year, Birmingham et al (1996) published their study. They examined the need for psychiatric treatment among newly remanded men in a large remand prison. 569 adult men were approached at

reception into prison. The authors used a semi-structured interview especially designed for the study as well as the SADS-L. They also examined medical records and the prison healthcare screen. Information was obtained in this way on all the men, despite 4% refusing to undergo face to face assessment. 26% (n=148) were found to have at least one mental disorder (excluding substance misuse). 4% (n=24) were psychotic. The study demonstrated that reception screening was extremely ineffective in detecting those who required psychiatric input. Just 34 of the total of 148 with mental disorder were detected, and just 6 of the psychotic group were identified. This was despite 14 of the psychotic group being so ill that they were referred for immediate transfer to NHS facilities.

The largest and most comprehensive study exploring mental disorder among prisoners was that carried out for the Office of National Statistics (ONS) by Singleton et al. (1998). 3,142 prisoners participated. The study took place across all prisons in England and Wales (N=131 at the time). The study sought to determine prevalence of psychosis, neurosis, substance misuse, personality disorder, deliberate self harm, post traumatic stress disorder and intellectual functioning. 2371 men took part, 1121 were sentenced and 1250 were on remand. This review will focus solely on the findings related to the 2371 male participants. Over two thirds of the men were under the age of 30. Prisoners were randomly selected from lists of all inmates in each prison. Prisoners underwent one overall interview, and then 1 in 5 prisoners underwent a more detailed interview focusing on identifying psychosis and personality disorder. The main assessment tool used was the Schedule for Clinical Assessment in Neuropsychiatry (SCAN; World Health Organisation, 1994). No collateral information was sought from other sources.

The authors found that just one prisoner in ten had no mental disorder at all, with the largest diagnostic group being personality disorder (80%). However, it was the rates of psychosis which were also surprising with 7% of male sentenced and 10% male remand having a psychotic disorder. These were much higher rates than previous studies. The study identified the characteristics of prisoners with psychosis: they were

more likely to be white, to have been sexually abused as children, to have experienced bullying, and to have been living alone prior to coming to prison. Poor intellectual functioning was also more strongly associated with psychosis. This was also the only study that examined co-morbidity. They found that functional psychosis more than doubled the odds of a person having other disorders. On average, the psychotic group had 3-4 other disorders.

The last study, carried out by the Offender Health Research Network (OHRN; 2009) was an evaluation of mental health in-reach team which had been introduced in prisons following the Singleton (1998) survey. The evaluation involved a study of prevalence of Serious Mental Illness (SMI) among prisoners and the associated in-reach intervention. Six prisons took part, five of them male, one of which held only sentenced prisoners. New arrivals to the prisons were identified from daily reception lists and approached to take part in the study. In the prison for sentenced men, due to the few new receptions, prisoners were randomly selected to participate. There was a two stage procedure, a screening, after which all positives and 5% of negatives were approached for further clinical assessment. A range of assessments were used but the main diagnostic tool was the SADS-L (Endicott and Spitzer, 1978). No collateral information was sought from other sources. 3842 prisoners were screened, and 1181 went on to have further clinical assessment. The rate of psychosis varied across the sites between 6% and 16%. The findings were extrapolated to the broader prison population using weighted logistic regression with the weightings calculated to account for the proportion in the sample interviewed at second stage that were positive or negative at screen in relation to proportion of prisoners initially screened. The authors reported a severe mental illness prevalence of 23%, of which 4% had psychosis.

Table 1: Prevalence studies of mental health among prisoners

Study	Sample	Methods	Prevalence Psychosis	
West, D.J. (1963) The Habitual Prisoner. London: McMillan and Co. Ltd.	100 men, all repeat offenders. Mean age 44 (range 30-80).	Interview with all but 4. Examination of social records. Interviews with family member or spouse.	10% psychosis prevalence.	
Birmingham, L; Mason, D & Grubin, D. (1996) Prevalence of mental disorder in remand prisoners: consecutive case study. BMJ. 313. 1521-4	569 men, aged 21 or over on remand. Setting: Durham prison – local remand jail, capacity for 640. Serves courts in area of Northern England, high levels of deprivation and unemployment. 66% sample white and aged under 30. 88% IQ below general population average.	Informed consent and confidentiality. Semi-structured interview designed for study. SADS –L for validity. CAGE for problem drinking. Severity of Dependence for substance misuse. Also self reported levels drug and alcohol use. Brief IQ test.	26% (148) mental disorder (exc substance misuse). 24 acutely psychotic. Lifetime rates of psychosis and non psychotic mood disorders 7% (between 6 and 8%). 14 psychotic group needed urgent hospital transfer. 6/24 psychotic group identified at prison screening. 19 refused to take part.	
Brooke, D; Taylor, C; Gunn, J & Maden, A. (1996). Point prevalence of mental disorder in unconvicted male prisoners in England and Wales. BMJ. 313. 1524-7	750 male unconvicted prisoners. Setting: 3 YOI and 13 adult men's prisons spread throughout England and Wales. Interviewed 544 men (9% adult remand) and 206 yo (10% of yoi). Mean age 27.5 yrs (sd 8.9).	Consent and Confidentiality. Cross sectional stratified random sample. Semi-structured interview with forensic psychiatrist. Interview designed for study and piloted. Collected demographic, personal and psychiatric history, IQ and	Psychiatric disorder 469 (63%) inmates (inc substance misuse). Psychosis 36 (5%). Of 36, 24 known to healthcare. 29/36 required transfer to NHS facilities.	

		current mental state. ICD-10 diagnoses. Also SADS –L (exc pd and substance abuse scales) for validity.	Refusal rate 18% (ranging between 4 and 31% depending on prison). No differences between refusers and participants on 25 demographic and clinical variables.	
Gunn, J; Maden, A & Swinton, M. (1991) Treatment needs of prisoners with psychiatric disorders. BMJ. 303. 338-41	1769 sentenced men. 404 in YOI. 1365 adult men. Setting: 16 prisons for adult males, 9 YOI. All prison types, security levels, and length of sentences.	Consent and Confidentiality. Random sampling. Information taken from prison file for demographic and criminological data. Semi structured interview with psychiatrist. Interview designed for study and piloted. Collateral info from IMR and NHS records where applicable. ICD-9 diagnoses.	652 (37%) psychiatric disorder. 34 (2%) psychosis. 22/34 psychotic recognised by prison healthcare staff. 30/34 recommended for hospital transfer. 7.5% men refused. 0.5% YO refused.	
Singleton, N; Meltzer, H; Gatward, R; Coid, J & Deasy, D. (1998) Office for National Statistics.	3142 prisoners interviewed. Setting: 131 prisons. 1415 male remand, 1254 male sentenced. 505 follow up interviews carried out. 25% male remand aged 16-20. two thirds under aged 30. 80% white. 13% black. Similar picture male sentenced (84% white, 10% black; less under 20s). 10% of sentenced group serving 10 or more years.	SCAN (Schedules for the Clinical Assessment of Neuropsychiatry). All lay interviews, then 1 in 5 subsample interviewed by clinicians. Algorithims applied to calculate probable psychosis in total sample. ICD-10 diagnosis applied. SCID-II for pd.	Total 6% refused. 7% male remand psychosis. 10% male sentenced. Schizophrenia or delusional disorder more common than affective.	Relevance to ARMS: 29% male remand group paranoid pd. 20% sentenced group. 2% of remand and sentenced schizotypal pd.

	Setting: 131 prisons			
Offender Health Research Network (2009). National Evaluation of In-reach.	Setting: 6 prisons a) local london high secure b) local London adult and young women c) privately run for young and adult men d) local remand high secure in north e) local male for adults f) male training Capacity varied 500 for e up to 800 and 1000. 1181 prisoners interviewed (969 men).	SADS –L Demographic proforma BPRS PRiSnQuest GHQ PSQ MAST DAST Random sampling from reception lists. In training prison, random sampling from system	All positives at screen and 5% negatives asked to do clinical interview. Psychosis across sample 10%.	? info refusers ? psychosis rates? Calculation –algorithims

Since this study began, there has also been one paper published of a study of at risk mental state among male young offenders (Flynn et al., 2012). The study was carried out in Ireland in a 217 bed institution for males aged 16 to 20 years between June 2011 and May 2012 as part of an audit and service development. Using the reception list, they selected every third reception with inclusion criteria being that they be first receptions (coming to prison for the first time). Participants were interviewed in their first seven days in custody using the Comprehensive Assessment for At Risk Mental State (the assessment as used in this study; see Section 5.2). There were 171 participants in the study, and 39 (22.8%) met criteria for at risk mental state. They also identified 3 participants with first episode psychosis (1.8%). At risk mental state was associated with lower mean functioning scores than the non at risk mental state group, a peak age of 18 years, and with cumulative substance and alcohol use. These variables were independent predictors when entered together in the model. The study was an audit, with a small sample, but nevertheless found a substantial rate of at risk mental state. However, the cumulative use of substances combined with an assessment in the early days of reception may have led to an inflated prevalence.

The studies provide valuable information on prisoner psychiatric morbidity but also have their methodological limitations. Information on those who refused to take part was compared to participants in just one study (Brooke et al., 1996) with no differences found, but even in this study there is no detail given on what variables the comparison was made. Two other studies collected information which was analysed as part of the entire sample (Gunn et al., 1991; Birmingham et al., 1996). There are difficulties in obtaining ethical approval for the collection of data about individuals who do not wish to participate in research. While individuals have the right not to participate in research, they do still have the right to access healthcare services. The purpose of the ONS study carried out by Singleton et al.(1998) was to provide baseline data that could then be used to inform policy decisions about the development of mental health services in prison. It is not only justifiable, but even advisable that at least minimal

information be sought about prisoners who refuse to participate in the research. Key data which would influence frequency and type of service use, such as age, ethnicity, medication, could be collected anonymously and would serve to build a more comprehensive picture of the potential mental health needs of this population. Information also missing is that of reasons for refusal. This is most likely due to research being voluntary and potential participants are informed they are not required to give a reason for refusal. However, a possible reason for refusal is because the prisoner is taking part in other activities (e.g. education, work, gym) and they simply do not have the time to participate in research. These types of prisoners are likely to be high in functioning and therefore causing a slight bias in the data collection, in that data is collected on those prisoners who remain on the wings and may be lower functioning.

The psychosis rates across the studies reviewed varied between 2% (Gunn et al., 1991) to 10% (West, 1963; Singleton et al., 1998). Brooker et al. (2005; 2007) has speculated that the differing rates are likely due to differing assessment tools. Interestingly, none of the studies which collected collateral information in addition to self report, noted whether there was ever any conflict between the two sources of information and if so how this was resolved. Until the OHRN (2009) study, earlier studies seemed to be reporting an increase over time in mentally ill individuals in prison. This increase has been associated with the closure of mental hospitals. Known as Penrose's Law, after Lionel Penrose, an American psychiatrist who wrote a paper suggesting that the problem of crime and mentally ill in prisons was due to a lack of hospital beds (described in Gunn, 2000). However, Gunn (2000) carried out a perceptive analysis criticising the implied causality of the correlation, noting that there is no evidence that it is the same population that moves between the two institutions.

The study by West (1963) which took place long before hospital closures, is lesser known and rarely quoted but reveals the same psychosis rate as the Singleton study more than 30 years later. One of the

key points identified by West to help explain high rates of psychosis in prisons is simply that individuals who are unwell are more likely to be identified in this kind of environment. The high prevalence of psychosis among prisoners being due to individuals either becoming psychotic or being detected as such within the prison setting may well be a contributing factor in these studies. However, a meta-analysis comparing prevalence of psychosis from a national survey of householders (Meltzer et al., 1995) with a national survey of prisoners (Singleton et al., 1998), found a difference in prevalence of 5.2% for the prison group versus 0.4% for the community group (Brugha et al., 2005).

1.4 Imported Vulnerability

The studies to date have all involved point prevalence rates. Brooker et al. (2009) has criticised the repeated investigation of point prevalence of mental disorder among prisoners since they provide no information on aetiology. There has been no data collection of incidence of psychosis in prisons. This is an important question as the assumption is that prison is detrimental to health and would be likely to push those who are vulnerable towards threshold for transition. This feels intuitively true, however, there is no data which has clearly identified how many individuals develop psychosis while in prison. There is strong and consistent evidence that the first week is a time of peak distress for prisoners, with almost one third of suicides occurring at this time (Shaw et al., 2004; Rivlin et al., 2010). There are two studies that have examined the course of psychosis from reception over a period of approximately six weeks and both found that imprisonment is not universally detrimental to mental health (Blauu et al., 2007; Hassan et al, 2011). Hassan et al. (2011) in data from the OHRN (2009) study found a non-significant decrease in symptoms of prisoners with psychosis and Blauu et al. (2007) in a study carried out in the Netherlands found a decrease in both positive and negative symptoms over a twelve week period from reception. The authors speculated that a good detoxification regime, regular meals, some level of daytime structure, and access to healthcare may contribute to improved mental health.

Risk factors associated with psychosis (discussed in the next chapter) are also common among prisoner populations. In her work on prison suicide, Alison Liebling has noted that large numbers of the prison population share the same risk factors as those in the community who attempt suicide: adverse life events, substance misuse issues, a history of educational and employment problems (Leibling, 1995, 2008). She described this as an 'imported vulnerability' (Liebling, 1995). Leibling (1995) carried out two studies in which she carried out in depth interviews with prisoners in establishments in England and Wales. She compared a total of 112 prisoners who had attempted suicide against a randomly selected sample of 120 prisoners drawn from the same establishments. She found marked differences between the two groups which became even more salient when they talked about their experiences of prison. Leibling (1995) identified a profile of prisoners who attempt suicide that she called 'poor copers'. They had experienced high levels of adverse life events, had poor interpersonal relationships, alcohol and drug misuse issues, had experienced social and economic disadvantage, and were more likely to have experienced bullying when in school, and childhood sexual abuse. She hypothesised that such individuals were already vulnerable before entering prison, and simply did not have the coping skills required for such a demanding environment. Prison exposed their vulnerability, and in an environment where the strength, both physical and psychological is highly valued, perceived helplessness could have brutal consequences.

The concept of imported vulnerability has not to date been broadened out to mental health and in particular psychosis in this country. However, Wolff and Shi (2009) in a large scale study in the United States involving 7000 male prisoners reported that almost 75% of prisoners with a mental disorder had experienced childhood trauma. The criminological literature on risk factors for offending reveals a substantial overlap with those for psychosis. Factors associated with an increased risk of offending, like those for psychosis, can be broken down into the biological and social (individual and community level). Criminal behaviour is known to be associated with biological factors, childhood adversity, substance

misuse, social disadvantage, urbanicity (Bartol and Bartol, 2011; Farrington and Welsh, 2007; Kneebone and Raphael, 2011). Biological factors include prenatal and perinatal complications and low birth weight which are associated with later conduct problems and delinquency (Kandel and Mednick, 1991). However, there is some evidence that the relationship is mediated by other factors such as being raised in deprived conditions (Hodgkins et al, 2001), and maternal use of substances (Larkby et al., 2011). Genetic influences occurs through hyperactivity which in turn is strongly associated with aggressive and anti-social behaviour (Monuteaux et al., 2009).

Social risk factors include family history of criminal activity, parental attitudes which condone criminal and anti-social behaviour, peer influence and law breaking at an early age (Besemer, 2012). These factors add to a picture of childhood adversity, social exclusion and urbanicity. Childhood adverse experiences which are associated with increased risk of criminality include growing up in a household with parents who are harsh, cruel, are highly inconsistent in their discipline styles, or are passive or neglecting (Youth Justice Board, 2005). Both physical and sexual abuse increase the risk of later violent offending (Widom and Ames, 1994). Having been a bully is also associated with later offending (Ttofi et al., 2011), as is parental conflict and family breakdown, although the latter are mediated by other factors such as good attachment with parents (Fagan et al., 2007). A recent survey carried out in the UK of prisoners' childhoods and backgrounds found high rates of child abuse and social disadvantage among the 1,435 participants (Williams, 2012a). A third had experienced childhood adverse experiences, including abuse and violence; 41% had witnessed violence in the home; 27% had been in foster care; 63% had been excluded from school temporarily, 42% had been excluded from school permanently; with over half regularly having played truant at school. This is a picture of chaos in the early years of life, with little or no structure and at times an absence of a safe environment. Various explanations (e.g. adverse experiences at a vulnerable age may lead to impulsive coping styles, or poor problem solving skills, poor

social information processing and low self esteem among others) have been touted as the associative mechanism (Farrington and Welsh, 2007).

As in psychosis, social exclusionary factors also raise the likelihood of offending, but the picture is somewhat muddled. Children who grow up in large families, that have low social income, poor housing conditions are at increased risk of later offending (Youth Justice Board, 2005). However, these factors also interact to create more problems for parents in supervising and disciplining their children (Youth Justice Board, 2005). Unemployment contributes to offending risk, but only in the presence of other risk factors (family attitudes towards the law, poor discipline etc) (Fagan et al., 2007). Children who do poorly at school and who play truant are also more likely to become involved in drug use and criminality (Youth Justice Board, 2005), but there is evidence that it is not lack of ability that drives the anti-social behaviour, rather feelings about themselves and their experience of school. Cumulative negative school experiences can lead to a sense of alienation and in children with already pre-existing risk factors for anti-social behaviour (e.g. family tolerance of law breaking), the result can open a trajectory towards offending behaviour (Sutherland, 2011). In terms of ethnicity, Black and Ethnic Minority prisoners make up 26% of the prison population compared to 9% of the general population (Ministry of Justice, 2011). They are over-represented at every stage of the justice system, including in prison. (Ministry of Justice, 2011). This is recognised to be at least in part due to racial discrimination within the system (Coid et al., 2002b; Phillips, 2011).

Mixed in with social exclusion factors are those related to urbanicity. The link between crime and urban environments is much the same as that of psychosis, with the highest crime rates in the most deprived inner city areas, and falling as the distance from the inner city increased (Cozens et al., 2002; Kneebone and Raphael, 2011). Living in poor conditions, in densely populated neighbourhoods where there are

high unemployment and crime rates all increase probability of criminal behaviour (Caspi and Moffit, 1993). The psychological impact of living in such environments has been linked to psychosis as discussed above, and the explanations drawn on come from the criminological literature. Shaw and McKay (1942) who theorised that high levels of social disorganisation cause a disintegration in social structure than impacts in individual lives in serious ways. They defined social organisation as an absence of formal and informal controls such as police presence, authoritative community figures, lack of friendship and neighbourhood networks, and high turnover of residents signifying an unwillingness to invest in the community. Social disorganisation and social exclusion are inter-connected and teasing apart the risks from the consequences is a challenge.

Teasing out factors which are direct risks from those that are associated with an offending outcome is at times difficult (Farrington and Welsh, 2007) but nevertheless important. It is only by identifying the direct risks that preventative measures can be effectively targeted (Farrington and Trofi, 2011). The study of psychiatric morbidity among prisoners outside of a sociological perspective appears to have its limitations. That there are high rates of psychosis among prisoners seems hardly surprising seen from this point of view. The question of how important coming to prison is as a risk factor for psychosis holds potentially important implications for both the individual, healthcare services and the criminal justice system.

1.5 Care pathways in prison

The pathway of care for an individual entering prison who has a mental illness is a necessarily simple one due to the limited range of services. At reception, prisoners undergo a healthcare screening, if they report a history of psychosis or other severe mental illness they will be referred to the prison in-reach team who will see them in the subsequent days on normal location in the prison. Normal location being considered the equivalent of the 'community' of the prison. As in the community outside, if the

individual is too ill to remain on normal location, they can be moved the healthcare inpatient wing of the prison. Individuals discharged from the healthcare wing will either go back to normal location or be transferred out to NHS facilities. This section will give a brief overview of each of part of that process.

Screening: Screening for mental health has its origins in the Prison Act of 1865 which required a prison surgeon to inspect all new arrivals with a view to detecting insanity (Smith, 1981). Healthcare reception screening later evolved to establishing whether prisoners were 'fit' for work (Grubin, 2010). There was neither any clear definition of 'fitness' in this context nor any plans of what to do in the event that an individual was 'unfit' for work. Prison reception healthcare screening has developed in the last twenty years to identifying individuals with mental illness and those who are at risk of suicide (Birmingham et al., 1998; Grubin et al., 2002). The process has been criticised for being impersonal, a kind of conveyor belt assessment in which prisoners are required to answer questions but receive little information (Shaw et al., 2003). It is often carried out during a chaotic reception process by primary healthcare staff who have little or no mental health training (Brooker and Ullman, 2008). Prisoners who are missed at reception will not see a member of healthcare staff on ordinary location unless they either request to do so, or their behaviour raises enough concern for them to be referred by the officers (Birmingham et al., 2001). An early study by Birmingham et al (1996) found that reception screening identified just 9% of prisoners with a mental disorder. Most cases were therefore missed. At the time, screening was carried out by a prison medical officer whose job it was to declare the person fit for work. Despite the process being revised with the emphasis being on detecting mental illness, Shaw et al (1999) found that cases were still missed.

Successful screening requires privacy, reassurance of confidentiality, and help for those with literacy problems (Shaw et al., 2003). Questionnaires need to be sensitive enough to detect mental health issues and specific enough not to generate too many cases that require further investigation (Grubin et al., 2002). It should be properly co-ordinated, being integrated within a service structure forming a care

pathway within the prison but also prior to reception and on release from custody (Birmingham et al., 2001). When done correctly, it has been argued, that screening can identify disorder, reduce suffering, reduce the risk of suicide and self-harm, and improve continuity of care. Furthermore, it can impact on the wider prison regime via the reduction of mentally ill offenders in prison, reduce disturbances on the prison wing and therefore reduce staff time associated with such disturbances (Birmingham et al., 2001).

Current national prison policy is for all prisoners to undergo a healthcare screening on reception to prison by primary healthcare staff. The screening tool varies slightly between prisons but is based on the questionnaire developed by Grubin (Grubin et al., 2002; Gavin et al., 2003). Questions are asked about past psychiatric history, current medication, current contact with mental health services, current self-harm/suicide ideation and previous attempts. This screening has been found to be effective at picking up severe and enduring mental illness but less effective at detecting lower level disorders (Brooker and Ullman, 2008). They address issues of having a diagnosis or having received treatment (e.g. Birmingham et al., 1998; Gavin et al., 2003). Screening is not about detecting symptoms. Should a prisoner present as obviously mentally unwell at reception they can be referred directly to the prison inpatient wing. This can also happen if the person is seen at court by a mental health team who can notify the prison in advance so that adequate preparations can be made. Those with mental illness identified at reception will be referred to the mental health in-reach team who will visit them at their locations within the prison.

In-reach: The first wave of in-reach teams in England and Wales were rolled out in 2001/2 (Brooker et al., 2005; Seddon, 2007). Over the next three years, in-reach teams were in approximately half the prison estate (Seddon, 2007), but only a few were funded by the NHS, the majority being managed by the Prison Health Service System (Brooker et al., 2005). There have been two studies evaluating the impact

of in-reach since then, both carried out by Brooker et al (2005 and 2009). Made up mostly of mental health nurses, the teams also have some input from other professionals (social workers, psychiatrists and occupational therapists) although the level of input from non-nursing professions has reduced over time (Brooker et al., 2005 and 2009). At the time of the first survey, a clear sense of role emerged from in-reach team members which was based on the policy of delivering care equivalent to the community scenario. In addition, in-reach teams saw themselves as playing an advisory role within the prison, providing information and advice to prison staff and providing a link between prison and NHS services with regard to clinical leadership and training.

From their inception, in-reach teams were well received by the prisons (Armitage et al., 2003). Prison officers showed a willingness to work with in-reach staff and both officers and healthcare staff reported improvements in mental health care, a reduction in stigma surrounding mental health issues, as well as training needs from prison staff being met (Brooker et al., 2005 and 2009). Nevertheless, there were some misconceptions as to the role of in-reach, primarily that they would not provide solutions to difficult to manage prisoners on the wings (Armitage et al., 2003). In order to be effective, in-reach team members needed to have clarity of function, active development of relationships with other stakeholders, and a degree of professional self-confidence to be able to challenge unhelpful barriers to mental health service delivery (Brooker et al., 2009).

Both surveys revealed that in-reach teams process large number of referrals, do many assessments, but it was less clear what interventions they were providing. The bulk of referrals come from prison healthcare staff, although there has been an increase over time in referrals from prison officers (Brooker et al., 2009). In both surveys, in-reach staff noted the high number of inappropriate referrals (prisoners who did not report serious mental health problems, but perhaps mild or moderate anxiety or depression

for example). Originally referral criteria was aimed at those with severe and enduring mental illness, but over time, the caseload profile has changed significantly. In the first survey, 57% of prisoners on the caseload had a serious mental illness and 32% had a personality disorder. These figures varied between prisons due to variation as to whether and how much the particular in-reach teams should be involved in the assessment and management of prisoners who self-harmed or those who had a diagnosis of personality disorder. By the time of the 2009 survey, 31% of prisoners on the caseload of in-reach teams had a mental illness, 16% had a personality disorder, while 31% had neither mental illness nor personality disorder. In-reach caseloads had increased by 32% between the first and second survey, while the number of staff had increased just 20%. A recent study found that in-reach teams managed just a small proportion of prisoners with serious mental illness (Senior et al., 2013) and that the reason was prisoners with serious mental illness were not being identified and referred by the other appropriate services such as at reception screening. That the caseload is increasing, but the proportion of prisoners with serious mental illness is decreasing suggests that either they are not being detected and/or in-reach are still perceived as having a role of providing support to prison staff for difficult to manage prisoners (Armatige et al., 2003).

One of the main roles of in-reach from the outset was to implement the use of the Care Programme Approach (CPA; Department of Health, 1990) with a view to ensuring continuity of care for prisoners on release from custody. However, the 2009 survey revealed a range of obstacles to achieving this, with a key problem getting community mental health teams (CMHTs) to engage with those released from custody. They reported that CMHTs often misunderstand that all ex-prisoners are 'forensic cases' and therefore require full forensic risk assessment. In addition, there were other practical barriers such as preparing everything with the CMHT for the day of release only for the prisoner to be transferred to another prison shortly before the release day (Brooker et al., 2009).

The introduction of in-reach teams was the applied response to the policy drive for equivalence of care. However, despite developments in the community in terms of crisis teams, support and recovery, first episode psychosis teams, there has been no further development of mental health services in prison (Brooker et al., 2007). In addition, Brooker et al's second survey in 2009 showed that in-reach teams struggled with recruitment. The isolation of staff from NHS services which raised concern in the original 'Patient or Prisoner?' report was expected to be addressed when the NHS became responsible for providing healthcare for prisoners. By being employed by the NHS, training and personal development would be available to prison staff as they would to all NHS staff. However, putting this idea into practice raises its own challenges since it involves time out of the prison. The main role of in-reach staff involves carrying out and documenting assessments. This necessarily reduces caseload management and intervention time. There is little room for professional development in the role, the exception being promotion to management positions. In addition, there is little in the way of multi-disciplinary roles within the teams, with most teams consisting of nurses and medical staff. Despite a recognised need for psychological, occupational therapy, and social work input, it is rare for these professionals to be actively integrated within prison mental health teams.

In addition, although the NHS is responsible for healthcare of prisoners, this at times conflicts with the requirements of the Prison Service. Prisoners who receive a mental health service in one prison can be suddenly transferred to another prison due to the needs of the prison. This would certainly interrupt any continuity of care as they will not see the same therapist in the different prison, but may also at times interrupt a care programme altogether if the service doesn't exist within the other prison.

Inpatient wings: Prisoners who are too unwell to remain on ordinary location can be admitted to the prison inpatient healthcare wing. These locations are often referred to as hospital wings, but the NHS

Act (1977) specifically excluded any part of a prison from being considered a hospital. Use of mental health legislation is therefore limited in this environment. The use of the Mental Health Acts is not permitted in any part of a prison, including the inpatient wing. There is a dearth of information about the role of prison inpatient healthcare wings and the characteristics of their residents. There are just three papers published on the subject: the first based on a prisons inspection (Reed and Lynne, 2000); the second a comparison of patients on a medium secure unit with those in a prison inpatient wing (Thomas et al., 2009) ; and the third, the results of an audit (Forrester et al., 2010). These papers paint a grim picture of mental health care in these units: few staff are mental health trained, there is a minimal input of any non-medical intervention with 'multi-disciplinary' input being limited to nursing and medical care, and prisoners spend on average 21 hours a day locked up (Reed and Lynne, 2000). Psychosis was present in 49% of prisoners in one paper (Thomas et al., 2009) and 60% in another (Forrester et al., 2010). Although prisoners cannot be treated under the Mental Health Act, they can be treated under common law at a specific time of risk, and this occurred in 13% over a four month period (Forrester et al., 2010). A substantial number of prisoners in prison inpatient wings have had no previous contact with services. Forrester et al.'s (2010) audit reported that one third of prisoners on the inpatient wing were receiving services for the first time.

As the Mental Health Act is not permitted in prison, patients who require treatment but are unable or unwilling to consent are referred for transfer to NHS facilities. Such are the length of delays in transfer that the need to address the issue has been repeatedly referred to in policy documents (Her Majesty's Inspectorate of Prisons, 1996; Health Advisory Committee for the Prison Service, 1997; Her Majesty's Prison Service & NHS Executive, 1999; Department of Health, 2001a). Isherwood and Parrott (2002) reported mean times of 100 days in their study of prison to hospital transfers; a similar length of delay was reported by Forrester et al. (2009), with just 20% of prisoners being transferred within a month of referral. In recognition of the problem, the NHS carried out a pilot initiative starting in 2005, with the aim

of completing the referral to transfer process in two weeks. An evaluation of the initiative was carried out by McKenzie and Sales (2008) based on data from HMP Pentonville in London. The mean waiting time was reduced from 77 to 53 days. 81% of those referred for transfer were psychotic, and 17% had had no previous contact with services. Half were non adherent to medication. The issue has strong implications for early detection and early intervention in psychosis, since current community aim is to treat as early as possible in a bid to reduce the duration of untreated psychosis which is associated with poor outcomes. In addition to prisoners being transferred to other prisons, while on remand, they can also be released unexpectedly either on bail or if their case is dropped or when they go to court and are found not guilty. This also means that remand prisons have a high turnover which in turn means that a person can be moved around within the prison on a frequent basis and/or receive new cell mates regularly. This provides for an unsettling environment for a person experiencing mental health problems.

1.6 Conclusion

Prevalence of psychosis is high among the prison population and prison is an unknown factor in the risk of psychosis development. Remand prisons, such as that of the study site, receive prisoners from court. The first week of custody is recognised as a time of high stress. New receptions undergo health screening with a view to identifying those who are receiving current psychiatric treatment or who are high risk for self harm or suicide. Prisoners who are missed at this stage will have little opportunity to be identified and may not know how to access health services in the prison. The pathway to NHS facilities in the community is often obstructed by lengthy and complicated bureaucratic procedures which cause long delays in the transfer process, during which time prisoners cannot be treated if they lack the capacity to consent. Prisoners share many of the socio-demographic risk factors that are found in psychotic populations suggesting vulnerability for mental health problems. The stress vulnerability model of psychosis postulates that risk for psychosis is increased in those who are already vulnerable.

Identification of such individuals in custody could offer a useful in understanding and mitigate the risk factors for psychosis in custody.

Chapter 2: Risk factors for psychosis

This chapter will provide an overview of the research to date on the social risk factors associated with psychosis, as well a summary of the literature around psycho-social features associated with transition to psychosis in those with an at risk mental state.

The aetiology of psychosis is important if we are to develop effective ways of preventing its onset and progress. The impact of prison itself on the development of psychosis is unclear, as there is no information on how many individuals become psychotic whilst in prison. It is recognised that the early days of custody are highly stressful, and one can extrapolate that the time attending court facing the possibility of prison is also very difficult. The stress vulnerability model of psychosis posits that those who have a predisposed vulnerability are at increased risk of psychosis. This notion has been explored extensively in the literature on prisoners who attempt and commit suicide by Leibling (1995, 2008) who found that people who are suicidal in prison share the same risk factors as people who are suicidal in the community. The risk of suicide in the prison increases as individuals who are already vulnerable are placed in an environment which can be hostile and demanding. This 'imported vulnerability' means the risk is increased rather than being created by the custodial setting. The concept of imported vulnerability has never been explored in relation to psychosis or other mental disorder of prisoners. This is important since some of the socio-demographic risk factors for offending overlap with those for psychosis.

Identifying the types of events that contribute to the cause or evolution of psychosis is important since it can aid the way in which interventions are developed and implemented. The stress vulnerability model of psychosis (Zubin and Spring, 1977) is based on the hypothesis that an individual's risk of psychosis is based on a biological susceptibility, such as a genetic predisposition or a physical trauma in early life. This

then combines with social stressors which can occur at an individual level (e.g. childhood adversity or cannabis use) or at community level (e.g. urbanicity, or minority group membership) to create a heightened vulnerability for psychosis (Shah et al., 2011; McGorry et al., 2006). The level of added stress required to propel such a person toward a psychotic episode would be relatively low compared to someone who had not experienced such risk factors. However, interventions could mitigate risk of psychosis. Even when adverse life events have occurred in the past (e.g. in childhood), it can be useful for the adult to have their experiences acknowledged and validated (Andresen et al., 2003). Psycho-educational models can be applied with a view to educating the person about the impact of drugs or alcohol, offering support, teaching problem solving skills, and imparting strategies to manage anxiety (Falloon, 1992, Singh and Fisher, 2005). Educating people about their symptoms and normalising their psychological experiences can be empowering, giving them hope which has been shown to be crucial in maintaining health and promoting recovery (Morrison et al., 2004; French et al., 2003).

Whether the event is a risk factor depends on authors' interpretation of the data, and the robustness of the methodological approach used. Susser (1991) proposed three criteria for risk factors to be considered aetiological: association, direction and temporal priority. Association refers to a relationship between the factor and outcome, so that when the factor is present, the outcome rate is higher than when the factor is absent. Direction refers to the changes in the factor causing changes in the outcome, e.g. a dose response effect, the higher the factor, the more likely the outcome. Third and most importantly, is temporal priority which refers to the order of the events. The risk factor must precede the outcome in order to demonstrate that it is causing the outcome.

This chapter will give a brief overview of some of the risk factors associated with psychosis and transition to psychosis. Recent advances have identified a range of risk factors associated with the onset of

psychosis including: obstetric complications, prenatal and post natal infection, season of birth, maternal malnutrition, maternal stress, migration, ethnicity, social disadvantage, adverse life events, and substance misuse (Dean and Murray., 2005). Each of these factors have a large investigative base and continue to be researched. It should be noted therefore that the purpose is simply to give an overview of the research to date. The risk factors described are not comprehensive. They are simply those that have relevance within the context of this particular study.

2.1 Genetic Vulnerability

The role of genetics in schizophrenia was first laid out in detail by Gottesman in Schizophrenia Genesis (1991). Gottesman demonstrated that the risk of schizophrenia increased on the basis of genetic proximity. While the average person has a 1% lifetime risk of developing schizophrenia, a child of two parents with schizophrenia has a risk of 46%, monozygotic (MZ) twin whose other twin has schizophrenia has a risk of 48% of developing the illness, a dizygotic (DZ) twin has a risk 17%, a non twin sibling 9%, grandchildren, nieces/nephews , aunts/uncles and cousins all run a risk of less than 5%. The closer the genetic link, the higher the risk. The genetic risk was further confirmed in studies of adopted individuals of a parent with schizophrenia. Children of an unwell parent who were 'adopted away' had a higher prevalence of schizophrenia than controls and than other children in the adoption family (Ingrahm and Kety, 2000). Since that time, there have been five further systematic studies of twins examining risk of schizophrenia. Craddock et al (2005) reviewed this literature. They report an MZ concordance rate of between 42 and 65%, and a DZ concordance rate of between 0 and 28%. These authors report this as calculated heritability rate of approximately 85%, among the highest of human illnesses, describing it on a par with heritability with height, diabetes type I and II, breast cancer and coronary disease in males.

A drawback to the genetic theory, is that there has been no single gene implicated, or even consistent evidence for a precise genetic region involved in the development of schizophrenia (Sullivan, 2005; Mortensen et al., 2010). Instead, what is emerging is an appreciation of the complex interactions of genes with environment in the field of epigenetics. The often quoted high heritability rate of schizophrenia has been criticised for not taking account of environmental factors (Maric and Svrakic, 2012; Zgaga and Rudan, 2012). The rate is based on a calculation of concordance rates between DZ and MZ twins. However, it has also been acknowledged that MZ twin studies in particular highlight the importance of environmental factors via their significantly less than 100% concordance rate, indicating that something else is at work. Recent work in epigenetics has shown that the environment modifies genes and that this most likely happens via Central Nervous System (CNS) pathways either before birth (e.g. viruses) or post birth (e.g. stress, cannabis use) thus influencing the development of a disorder in indirect ways (Maric and Svarkic, 2012; Zgaga and Rudan, 2012). Genes, via an interaction with environment increase or decrease the likelihood of developing a disorder (Van Os et al., 2008). A search of the literature revealed no published research on family history of psychosis or other mental illness among prisoners.

2.2 Adverse Life Events in Childhood

Following the publication of Holmes and Rahe's (1967) checklist of stressful life events designed to identify the preceding life changes prior to the onset of illness, there was a wave of research examining the link between stressful life events and psychiatric morbidity (e.g. Vinokur and Selzer, 1975; Grant et al., 1976; Yager et al., 1981; Cooke and Hole, 1983), and in particular the link to schizophrenia (Rabkin, 1980; Day, 1981; Norman and Malla, 1993). The role of adverse life events in the development of mental ill health has been a source of growing interest over the last two decades. In particular, there has been a body of research examining events in childhood and their impact on mental disorder in general but in particular of their role in the development of psychosis. Various studies have linked adverse life events

in childhood with mood disorders, substance misuse, post traumatic stress disorder, personality disorders, and anxiety disorders (Kessler et al., 2010; Spataro et al., 2004; Scott et al., 2010; Afifi et al., 2012). The association with psychosis has also been confirmed with patients with psychosis found to have much higher rates of exposure to childhood adverse events than those who did not have psychosis (Varese et al., 2012; Shevlin et al., 2008; Bendall et al., 2008; Bebbington et al., 2004). In particular, there is a consistent finding for an association between hallucinations and childhood adversity (Read et al., 2005; Morgan and Fisher, 2007). Some studies have found a link between particular types of adversity and psychosis. Bebbington et al. (2004) found all types of trauma to be related to psychosis but the largest effect was for sexual abuse. Van Dam et al (2012) carried out a review of the literature examining the relationship between bullying and psychotic symptoms in both clinical and general populations and found that school bullying is related to non clinical psychotic symptoms. These authors also found the associations to be stronger according to an increased frequency, severity and longer duration of being bullied. Long term separation from a parent before the age of 16 has also been found as an associated factor with psychosis (Stilo et al., 2012; Morgan et al., 2007a).

Specific types of abuse as risk factors are exceptions in the literature. Reviews of the evidence point to a dose effect of adversity rather than particular types of adversity increasing the risk of psychosis (Varese et al., 2012; Shevlin et al., 2008). However, despite some contentions made about childhood adversity causing psychosis (Read et al., 2005), various authors have noted the methodological weaknesses that preclude such a conclusion. Morgan and Fisher (2007) criticised the use of basic measures of adversity and for what they described as 'the lack of clearly formulated mechanism between psychosis and socio-environmental factors'. Bendall et al (2008) pointed out that often in studies there is a lack of statistical power, insufficient attention paid to possible confounding variables, use of cross sectional research designs and problematic adversity measures. While Morgan and Fisher (2007) concluded that the evidence to date does not support a causal relationship, other authors suggest that cumulative adversity

in childhood significantly increases the risk of psychosis (Varese et al., 2012; Shevlin et al., 2008). Prevalence of child adversity is high among prisoners. The survey of prisoners' backgrounds by Williams et al. (2012a) based on a sample of 1,425 prisoners found that 24% of participants reported having been in care as child, 9% had experienced sexual abuse and 17% had experienced physical abuse as children, while 41% had witnessed violence in the home.

2.3 Substance Misuse

In recent years, a large body of research has been dedicated to the role of cannabis as a trigger for psychosis. A number of longitudinal studies involving large samples have demonstrated an association between use of cannabis and psychotic symptoms (Andreasson et al., 1987; Thornicroft et al., 1990; Zammit et al., 2002; Henquet et al., 2005; Casas et al., 2010). However, the risk of developing psychotic symptoms is mediated by certain factors. Probably the most consistent finding in the literature is the influence of a dose response relationship, so that the risk of psychotic symptoms grows as cannabis use increases (e.g. Zammit et al., 2002; Van Os et al., 2002). In addition, early age of use is more likely to influence the development of psychotic symptoms (Arsenault et al., 20024; Farrell et al., 2002; Casas et al., 2010). Finally, there is some evidence which points to repeated use of cannabis causing symptoms, which might otherwise be transient, to persist and progress to threshold level of psychosis (Kuepper et al., 2011). However, there is evidence that it is the more potent form of cannabis, skunk, which incurs the higher risk for psychosis (Di Forti et al., 2009). While the support for an association between cannabis use and development of psychotic symptoms is strong, a causal relationship has yet to be demonstrated. There is agreement in the literature that heavy cannabis use can precipitate psychotic symptoms in those who have a vulnerability for psychosis (Verdoux et al., 2003; Semple et al., 2005). However, the question remains as to whether cannabis use can lead to psychotic symptoms de novo. Some authors have concluded that this is the case (Fergusson et al., 2003; Van Os et al., 2002). Andreasson et al. (1987) whose hallmark study established a relationship between use of cannabis and development of

schizophrenia, noted that while many of those who developed schizophrenia had had heavy cannabis use, only 3% of heavy users went on to develop schizophrenia, suggesting that other factors impacted on the relationship. Henquet et al. (2005) found that the effects of cannabis were much stronger in those with any predisposition towards psychosis (as defined by scores on paranoid ideation and psychoticism subscales).

A further problem with the hypothesis is the rise in cannabis use in the last two decades has not been paralleled with an escalation in incidence of psychosis (Semple et al., 2005). The finding that early and heavy use of cannabis is a risk factor also raises questions about the home environment. Houston et al. (2008) analysed data of 5877 participants with psychosis from the National Co-morbidity Survey in the United States to look at effects of cannabis use in the context of child sexual abuse. They found no main effects for these variables separately but did find a significant interaction for child sexual abuse. The interaction was significant for participants who had used cannabis before the age of 16, and controlled for wide range confounders (including urbanicity, ethnicity, depression, education). Further research to examine the relationship between childhood adversity and early cannabis would be useful to build a comprehensive picture of the role of cannabis in the development of psychosis.

There are 130,000 new admissions to prisons in England and Wales every year, 70% of whom will have recently taken drugs (National Treatment Agency for Substance Misuse, 2011). A busy local prison, such as the site in this study, will treat 3000 new prisoners with drug dependence every year (National Treatment Agency for Substance Misuse, 2011). The strategy to address drug use inside prison was laid out in a Government White paper, Tackling Drugs Together (Her Majesty's Stationary Office, 1995). A combination of good security and provision of services of drug users were established as the key elements of the strategy. Mandatory drug testing was introduced in 1996 (National Treatment Agency

for Substance Misuse, 2011) which requires every prison to test between 5-10% of its population, with prisoners who refuse incurring penalties. Cannabis is believed to be the most widely used drug inside prison, but there is little up to date information on levels of use among prisoners. Data taken from the Prisoner Psychiatric Morbidity Survey by Singleton et al. (1998) found 79% of male sentence and 82% of male remand prisoners to be cannabis users, over half (59%) having started use before the age of 16, 9% describing dependence on the drug, and approximately 40% having used cannabis during their time in prison at the time of the survey (Singleton et al., 2003).

2.4 Migration/Ethnicity

The high incidence of psychosis among Black ethnic groups in the UK has been a consistent finding in the literature. Incidence of psychosis among the Black Caribbean population has been found to be between two to eighteen times higher than their White British counterparts (Morgan et al., 2006). The investigations into ethnicity and psychosis drew on earlier studies which identified high incidence rates of psychosis among migrants in the United States (e.g. Ödegaard, 1932; Malzberg, 1955). Various studies since in different countries have confirmed the findings. Cantor-Graae et al (2005) for example examined a population based cohort 2.14 million people in Denmark and then looked at the schizophrenia cases within the cohort. They found a significantly higher incidence of schizophrenia for both first and second generation migrants compared to Danish non migrants. Selten et al (2002) in a study carried out in the Netherlands found a higher incidence of schizophrenia in Surinamese immigrants. These findings were also confirmed for immigrants to Sweden, in particular from East Africa (Zolkowska et al., 2001). Initial theories of selective migration in which it was thought that individuals at high risk of psychosis were more likely to migrate have been ruled out on the basis that incidence rates are higher in second rather than first generation migrants (Cantor-Graae et al., 2005). In addition, selective migration fails to explain the higher incidence of psychosis among individuals who had migrated as children and young adolescents (Cantor-Graae et al., 2005). Furthermore, incidence levels of psychosis are not higher in

immigrant countries of provenance (Fearon et al., 2006; Sharpley et al., 2001). The higher incidence has also been explained via diagnostic bias in which it is thought that mental health assessments by western psychiatrists are not sensitive to cultural beliefs and therefore are more likely to result in misdiagnosis (Williams., 2007; Patel et al., 2007). However, the evidence does not support the hypothesis. Migrant and ethnic groups show similar clinical characteristics and age of onset as other populations, and British and Jamaican psychiatrists do not differ in their diagnoses (Morgan et al., 2010; Cantor-Graae et al., 2005). The diagnostic bias concept has also been undermined by studies of psychotic like experiences in the general population which have confirmed a higher rate of these experiences in Black and Ethnic minority groups (Morgan et al., 2009; Johns et al., 2002).

A more consistent finding is the association between ethnicity, psychosis and social factors. Associations between ethnicity and psychosis have been found to be mediated by urbanicity (Morgan et al., 2006); unemployment, low socio-economic status, lone parent status, low perceived social support (Brugha et al., 2004; Kirkbride et al., 2008; Cooper et al., 2008); perceived discrimination (Veling et al., 2007); and negative ethnic identity (Veling et al., 2010; Cooper et al., 2008). These latter have been further endorsed by studies which have examined ethnic density, and found higher rates of psychosis among ethnic groups that form a small proportion of the total population (Veling et al., 2008; Schofield et al., 2011). These associations also held for higher rates of psychotic like experiences in the Black non-clinical populations (Morgan et al., 2008).

While prevalence rates in the community do not differ as markedly as incidence rates they nevertheless remain higher in Black groups (Brugha et al., 2004). This is in contrast to data about prisoners. There are no incidence studies of psychosis in prison populations, but Coid et al (2002a) examined prevalence of psychosis among different ethnic groups using the data from the Singleton et al (1998) study. The

authors found a lower prevalence of psychosis among the Black groups than White. Social disadvantage is a characteristic of prison populations as a whole which may contribute to leveling out differences across ethnic groups. They also found high rates of imprisonment for Black prisoners compared to White, that could not be accounted for by the types of crime committed, suggesting that there was some level of discrimination in the criminal justice system. The London prison population, including the study site, is reflective of the London population with 49.1% of prisoners being of a non-white ethnicity compared to the national average of 25.7% (Ministry of Justice, 2011). The criteria for this study included belonging to one of four south London boroughs which cover the geographical area of the local NHS Trust. These boroughs have an ethnic diversity of approximately 40% White British, 23% Black Caribbean and African, with the remainder Asian and other ethnic minorities (New Policy Institute and Trust for London 2011).

2.5 Social Exclusion

The role of social disadvantage and exclusion in the aetiology of psychosis was a subject of investigative interest decades ago (e.g. Faris and Dunham, 1939; Clark, 1949, Hollinghead and Redlich, 1958, Goldberg and Morrison, 1963, Kohn, 1976). In the last twenty years, this area has re-emerged as an important focal point of study. The concept of social exclusion encompasses a range of factors which overlap with social disadvantage and include: unemployment, poverty, housing, social isolation, education, low income, living alone and low social support. Defined by the Social Exclusion Unit (SEU, 2004) as 'a short-hand term for what can happen when people or areas face a combination of linked problems, such as unemployment, discrimination, poor skills, low incomes, poor housing, high crime and family breakdown. These problems are linked and mutually reinforcing.' Since psychosis can both cause and lead to social exclusion, the focus has been on trying to unpick causal factors from those that are consequences of psychosis (social drift). The association between social exclusion and psychosis has been found in a number of studies. Meltzer et al (1995) in the population survey of psychiatric morbidity found

unemployment to significantly increase the odds of many mental disorders, but in particular, trebling the odds of functional psychosis. Stilo et al (2012) carried out a study of 278 patients compared to 226 controls with first episode psychosis, looking at social exclusion indicators in childhood and in adulthood. They found their three indicators of social exclusion in adulthood (unemployment, living alone and being single) were more prevalent in cases. All indicators were significant in the year prior to contact with services, but only unemployment was significant five years prior to service contact. These authors found a clear linear relationship between cumulative social exclusion factors and psychosis, so that odds of being a case increased with the number of social exclusion factors present. They also tentatively concluded that the relationship was causal due to i) the childhood factors which clearly precede illness and ii) the dose response relationship. Reininghaus et al (2008) examined the association between unemployment and duration of untreated psychosis and first episode psychosis; and whether the gap between employment expectations and actual employment was associated with first episode psychosis. Their findings supported the hypothesis that social contacts mediate the relationship between unemployment and psychosis. They also found that participants who had not attained their employment expectations were more likely to be cases. The authors concluded that unemployment, social isolation and employment expectations and attainment were all important factors in the risk for psychosis. However, they also noted that it was not possible to draw conclusions about causality as there was no way of knowing whether low social contact had been a consequence of psychosis or prodrome or whether it had preceded it.

The literature is not unequivocal. Mulvany et al (2001) looked at whether low parental social class increased the risk of developing schizophrenia in a case control study of 252 patients. They found no such association, although they did find that individuals from lower social class accessed services significantly later than those from higher social class. A strong proponent of social exclusion having a causal role in psychosis is Read (2010) who is highly critical of the medical model remaining a dominant

paradigm in psychosis despite what he reports as the lack of evidence for genetic and biological factors. However, Morgan et al (2007b) have criticised the literature for often failing to define social exclusion or social disadvantage, and for the lack of clarity around distinguishing direct and indirect risk factors and indicators and measures. For example, is unemployment a direct measure of social exclusion, is it a risk factor, or is the relationship correlational? Nevertheless, the recent interest in the role of social exclusion factors in psychosis appears to be justified. Furthermore, Murali and Oyebode (2010) have pointed out the complexity of untangling the inter-related aspects of social exclusion. Those who are poor may not have jobs, or if they do, they may be stressful, unrewarding and depersonalising work, they live in threatening environments, and are often unaware of how to access information and support.

Levels of social exclusion among prisoners are high and begins from an early age. Williams et al. (2012a) reported from a survey of 1425 prisoners that 41% were permanently excluded from school. Just 32% were in paid employment prior to custody, but 13% had never had a job. Almost a third (28%) had been in their accommodation prior to custody for less than six months. Levels of homelessness are high in this group with 15% reported being homeless before prison (compared to 3.5% of the general population) and this included 9% who had been sleeping rough.

2.6 Urbanicity

One of the most consistent and strongest findings in epidemiological research of schizophrenia is that of the association between urbanicity and psychosis. First identified by Faris and Dunham (1939) in Chicago, they established that the highest rates of admission for schizophrenia were for the deprived inner city areas, with the rates decreasing as the distance from these areas grew. This is also a pattern for crime rates (Cozens 2002; Raphael and Kneebone, 2011). The findings have since been replicated in various studies (e.g. Van Os et al., 2002; Morgan et al., 2006; Krabbenham and Van Os, 2005). Furthermore, the

evidence points to a causal relationship, although the exact nature of the relationship remains unknown. The idea that individuals who are likely to develop psychosis somehow end up living in more urban areas (the selection hypothesis) has seemed less probable as time goes on. The evidence is more heavily weighted towards a causal model due to a number of factors. Firstly, results show that high incidence of psychosis is not associated with adulthood, but with urban birth and upbringing (Krabbendam and Van Os, 2005; Spauwen et al., 2004; Pederson et al., 2001) meeting Susser's (1991) temporal priority condition. Secondly, there is also strong evidence for a dose response relationship, so that the longer the period of urbanisation as a child or adolsecent, the more urban the environment, the higher the risk of psychosis (Vassos et al., 2012; Sundquist et al., 2004; Pederson et al., 2001). Furthermore the findings are consistent across various cultures and countries (Krabbenham and Van Os, 2005; Vassos et al., 2012).

The relationship between urbanicity and psychosis holds even after controlling for various confounders such as age, social class, drug use, family history and others (Krabbendam and Van Os, 2005; Vassos et al., 2012). However, a major problem of the urbanicity relationship with psychosis is the mechanism by which it functions. There is some evidence that the relationship may be mediated by genetics (Van Os et al., 2003), but for the most part it is believed that urbanicity is a 'proxy description for some underlying environmental factor or factors in urban areas' (Krabbenham and Van Os, 2005). Recent hypthoses have focused on 'social capital', the concept of social networks in neighbourhoods which are centred around shared values and co-operation between individuals (Paldam, 2000). Social capital draws from social disorganisation theory which has been used in the criminological literature to explain and predict levels of crime by geographic areas (Shaw and McKay, 1942). An organised society is one in which there is co-operation by individuals and institutions who share similar values and where therefore there is a high level of participation in activities across the different sections of society (Jensen, 2003). A breakdown in such relationships leads to disorganisation and fragmentation and is brought about by rapid growth and change so that 'social rules' failed to be passed on (Jensen, 2003). However, the same

issue occurs for urbancity and social capital as does for social exclusion and social disadvantage: that of unpicking the inter-related aspects of the issue (Murali et al., 2010). The study site is a prison which serves some of the most deprived boroughs in the south part of London, including areas with a high incidence of psychotic disorders (Kirkbride et al, 2008). This area London has the highest rates of unemployment, low income, low level of education and homelessness in the city (New Policy Institute, 2011).

2.7 Risk factors for transition to psychosis

The literature above has centred on factors which are associated with the risk of frank psychosis. They indicate profile differences which may give an understanding of causal influences in the aetiology of psychotic disorders. The ARMS literature has also sought to understand the profile differences of those who make transition to psychosis with those who do not within the specified follow up periods. Much of the literature is focused on the ARMS criteria itself and how effective it is at predicting transition, but there have also been strong efforts to build a broader clinical profile of individuals as well as some studies which have examined socio-demographic risk factors associated with ARMS and transition to psychosis. Since the strongest risk factor for psychosis is a first degree family history of the illness (Maki et al., 2005), this has been incorporated into the at risk mental state criteria. Schizotypal personality features are also associated with transition to psychosis (Mason et al., 2004; Johnstone et al., 2005; Ruhrmann et al., 2010). These formulate the state and trait criteria along with a decline in functioning, which is the most consistent clinical factor associated with transition (Mason et al., 2004; Lam et al., 2006, Ruhrmann et al., 2010; Velthorst et al, 2013), at times this is only in the context of a family history of psychosis (Cannon et al., 2008). Notably, some authors have found that it is low baseline functioning scores that have predicted transition outcome (Cannon et al., 2008; Valmaggia et al., 2013), while Velthorst et al. (2013) commented from their study that it was not low functioning at baseline, rather the decline in the following this that predicted transition. However, the family history groups are the

smallest with the ARMS studies (Olsen and Rosenbaum, 2005) and also appear to confer the lowest risk for transition when not overlapping with other high risk criteria such as attenuated psychotic symptoms (Nelson et al., 2011). Positive symptoms have also been found to be associated with transition (Lam et al., 2006; Cannon et al, 2008; Ruhrmann et al., 2010), as well as negative symptoms (Lam et al., 2006; Demjaha et al., 2012; Valmaggia et al., 2012), cognitive disorganisation (Demjaha et al., 2012) and anhedonia (Mason et al., 2004; Valmaggia et al., 2012). Valmaggia et al. (2012) found that different classes of symptoms incurred different risks and that it was symptomatic clustering that was more predictive of transition rather than individual symptoms. Mood disorders are common in the ARMS individuals but depression has not been found to be associated with higher risk of transition to psychosis (Fusar-Poli et al., 2012a), and neither has anxiety (Fusar-Poli et al., 2012a; Salokangas et al., 2012a), although there are some exceptions. Johnstone et al. (2005) found anxiety to be significantly associated with transition and Salokangas et al. (2012) found a current depressive or bipolar disorder to be associated with psychosis outcome. Fusar-Poli et al. (2012a) have speculated that prevalence of depression and anxiety in those at risk of psychosis, without its association with transition, reflects underlying abnormal mood processes in this state (Fusar-Poli et al., 2012a).

Ziermans et al. (2011) found no differences in either clinical or socio-demographic variables between those who remitted from ultra high risk or transitioned to psychosis. However, other authors have identified differences between those that remit or remain at high risk status and those who go on develop frank psychosis. Draght et al. (2011) in a study carried out in the Netherlands involving 74 patients at clinical high risk for psychosis found urbanicity to be a risk factor for transition to psychosis. The authors state that all participants were recruited via referral to their hospital but do explain how some come to be from more urban areas than others. Fisher et al. (2012) in the UK Avon Longitunidal Study of Parents and Children studied data of 6692 participants, with children being interviewed about psychotic symptoms at a mean age of 12.9 years. They found that bullying and exposure to domestic

violence were associated with psychotic symptoms but that the relationship was mediated by other factors (anxiety, depression, locus of control and self esteem). An earlier study by Kelleher et al. (2008) examining psychotic symptoms in 211 high risk adolescents also found bullying to be associated with psychotic symptoms. However, it was being both a bully and a victim of bullying (together, not individually) that was associated with symptoms. They also found an association between symptoms and physical abuse, and witnessing violence in the home. Thompson et al. (2009) examining childhood trauma in a sample of ARMS patients found an association between attenuated positive symptoms and a total trauma experienced, but this was almost exclusively in the ethnic minority participants who had reported greater levels of trauma than the white group. However, the sample consisted of just 30 participants and no comparison was made with other non ARMS groups. Harley et al. (2010) also found that childhood trauma significantly heightened the risk of experiencing psychotic symptoms and the risk was further increased with early cannabis use. Both factors were independent predictors but the interaction between the two increased the risk further. A further associated factor associated with transition found by Salokangas et al. (2012b) was the patient having a perceived negative attitude by others at baseline. The implications for the development of persecutory ideas are discussed in the paper. The risk factor profile is not always consistent, most likely due to the low number of individuals who make transition are relatively small in the samples (between 8 and 55). Added to these factors are the ARMS criteria itself which will be discussed in detail in the Chapter 4.

2.8 Conclusion

Socio-demographic characteristics associated with risk for psychosis overlap with those for offending. Taking into account that coming to prison can be viewed as an extra stressor, the risk for individuals who have an at risk mental state making transition in this environment may be greater than in the community. Entry to prison, a perceived hostile environment, is particularly stressful in the first few days. Added to which, a significant proportion of prisoners will require a substance use detoxification regime,

as well as there being a broad range of mental disorder among this population. Furthermore, psychotic like experiences are known to exist across a continuum and are more common in some cultures than others, without necessarily causing distress. This presents particular challenges in identifying anomalous experiences that indicate a risk for psychosis. Nevertheless, as will be discussed in the next two chapters, some types of psychotic like experiences do seem to increase the risk of developing psychosis. In the last two to three decades there has been a move towards trying to reduce the risk by intervening as early as possible.

Chapter 3: Diagnostic Issues

This chapter summarises the diagnostic issues which arise from the way psychosis is defined in the diagnostic manuals, the debate around the alternative conceptualisation, the dimensional view of psychotic symptoms which forms the basis of the at risk mental state concept.

3.1 Introduction

The current conceptualisation of psychosis is based on the notion that an individual has met threshold criteria which indicates the point at which intervention is required. However, despite the neo-Kraepelin assertion that 'there is a boundary between the normal and the sick' (pp. 104, Klerman, 1978), it has long been recognised that frank psychosis is an extreme end of a continuum. Sullivan (1927) commented 'The institutional physician cannot but realize that those who require supervision are but that portion of the psychotic who are so in the grip of their eccentricities as to be rendered conspicuous' (pp. 106). Bleuler (1950) had commented that 'no sharp line can be drawn between healthy and abnormal' (pp. 276). He went on to add in the same section that 'the psychoses may be simple deviations from a norm in varying directions and degrees'. However, the utility of diagnostic categories has outweighed the uncertainty of the categorical model. Diagnostic categories facilitate communication between clinicians and enableresearch of aetiology (Van Os and Tamminga, 2007), and crucially, determine the point and type of intervention for patients (Jablensky, 2010). This chapter will focus on criticisms of this so called threshold defined by the diagnostic manuals. This conceptualisation of psychosis has been challenged by the continuum or dimensional model which hypothesises the distribution of psychotic like experiences on a continuum across the population (Strauss, 1969), which in turn has been criticised for failing to provide adequate understanding of how some individuals advance towards the extreme end of the continuum and develop psychosis (David, 2010). Pre-morbid histories of those who develop schizophrenia suggest that there are multiple factors involved in the evolution of the illness which date

back to childhood (Davidson, 2001). Recent investigations are examining new ways of understanding psychosis development based on symptom dimensions and a stress vulnerability model (Demjaha et al., 2012).

3.2. Defining psychosis

Both Kraepelin and Bleuler regarded psychosis as the extreme end of a continuum and that subtler forms of psychotic like experiences were broadly distributed in the general population (Klosterkotter et al., 2008). Nevertheless, psychiatry, for purposes of utility, has defined discrete diagnostic categories which are either present or absent (Klerman, 1978) creating a simplistic conceptualisation of mental ill health (Bentall, 2006; Boyle, 2002). Diagnostic categories are defined by the diagnostic manuals (Diagnostic and Statistical Manual for Mental Disorders and the International Classification of Diseases). The first DSM was published in 1952, the second in 1968. Criticisms of poor reliability of diagnosis led to a complete restructuring of the third version which in turn influenced the development of the ICD-10. DSM-II, 150 pages long with 40 contributors evolved into DSM-III, 500 pages long with a long list of contributors comprised of 25 advisory committees and 230 consultants (Kutchins and Kirk, 1997). Published in 1980, some diagnoses where removed (e.g. homosexuality), others were introduced (e.g. post traumatic stress disorder) following strong public campaigns. Whereas DSM-II had provided descriptions of various mental disorders, DSM-III provided descriptions as well as lists of symptoms with minimum criteria to meet the threshold for the disorder. DSM-III was revised and republished in 1987 as DSM-III-R, and then again as DSM-IV in 1994. DSM –IV was a 900 page volume created by over 1000 contributors, most of whom were psychiatrists. ICD-10 was developed partly in consultation with some DSM-IV contributors, but had a multi-disciplinary involvement. A more recent edition of DSM-IV was published in 2000, DSM-IV-TR (Text Revision) which incorporated further information about the listed disorders but was essentially similar to the previous 1994 edition. Publication of DSM-5 is due in 2013.

Criteria for DSM-III were based on agreement by the contributors following field trials which satisfied their standard of reliability (Bentall, 2006; Kutchins and Kirk, 1997). However, this approach has been heavily criticised for ignoring the poor validity of the concept of schizophrenia and other mental disorders. Critics have argued that while reliability standards may have been met, the criteria are not based on objective scientific research and the issue is therefore one of validity (Allardyce et al., 2007; Bentall, 2006; Boyle, 2002). Furthermore, the inclusion and exclusion of diagnoses based on public campaigns highlighted the social and political, rather than scientific arguments underpinning psychiatric diagnoses (Kutchins and Kirk, 1997). Detractors of the diagnostic manuals have noted that criteria for psychosis is defined by consensus, and that that consensus is directly affected by the social context in which it occurs (Bentall, 2006; Boyle, 2002). The validity of the criteria has long been criticised for its lack of objective evidence base, its reliance on subjective judgements by clinicians and the assumption that the threshold criteria clearly demarcate those who are unwell from those who are not (Bentall, 2006; Boyle, 2002; Jablensky, 2010). Maj (1998) carried out a critique of the DSM-IV criteria pointing out that the diagnosis of schizophrenia was dependent upon 'chronological, functional and exclusion' conditions and that all of these were essentially based on the subjective opinion of the assessor. The chronological condition requires that signs of disturbance be present for at least six months which can include the prodromal phase, with active symptoms being present for at least one month. Functional decline should be 'for a significant portion of the time since the onset of the disturbance'. These conditions require judgements as to when the onset of the disturbance occurred, at what point did active symptoms begin, and what 'a significant proportion' of time constitutes. To further complicate matters, ICD-10 criteria does not require a six month presence of disturbance for a diagnosis of schizophrenia, just the one month time frame of active symptoms (Jablensky, 2010). Furthermore, there is no requirement of functional decline in the ICD-10 (Jablensky, 2010). Maj (1998) notes that at least two symptoms are required for DSM-IV criteria of schizophrenia out of hallucinations, delusions, disorganised speech, grossly disorganised or catatonic behaviour, or negative symptoms, but that no clustering of symptoms is

identified, thereby negating the notion of a schizophrenic syndrome. Furthermore, the six month criterion includes sub threshold symptoms defined as 'odd beliefs and unusual perceptual disturbances'.

3.3. The continuum hypothesis

Inconsistent definitions are further complicated by evidence that psychotic like experiences occur on a continuum in the general population (e.g. Hanssen et al., 2005; Strip and Letourneau, 2009) and are expressed in differential rates according to cultural background. Prevalence of such experiences is higher in Black populations (Myers et al., 2011; Morgan et al. 2009), including children of Black ethnicity (Laurens et al., 2008). Of note is that such experiences are associated with indicators of childhood and adult social disadvantage (Morgan et al., 2009) and with ethnic density which in turn is associated with social adversity (Das-Munshi et al., 2012). However, these also demonstrate a link between such experiences and psychosis since incidence of psychosis is significantly higher in Black compared to White populations (Morgan et al. ,2006; Schofield et al., 2011). The concept of a 'psychosis proneness' had emerged earlier in the literature. Rado (1953) had referred to the 'ensemble of psychodynamic traits' which underlie schizophrenia and which constitute a predisposition for schizophrenia as schizotypy. The idea was taken up by Meehl (1962) who described psychotic like traits in the close family members of individuals with schizophrenia (Meehl, 1962, 1989). He believed that these schizotypal personality features, in a minority of individuals, led to the development of schizophrenia (Meehl, 1962, 1989). A strong proponent of the biological and genetic basis of schizophrenia, he thought that it would be the environmental factors which interacted with schizoptypy that would cause the degeneration in schizophrenia (Meehl, 1962). However, it was a seminal paper by Strauss (1969) that laid the foundation for the premise that hallucinations and delusions are not discrete phenomena that are either present or absent, but rather they exist along a range with varying degrees of conviction, plausibility, spiritual/religious beliefs, and pre-occupation. Since then various studies have supported the idea of a distribution of positive symptoms in the general population (e.g. Nuevo et al., 2010; Freeman et al.,

2005; Johns et al., 2004). A meta-analysis of the literature by Van Os et al. (2008) found a median prevalence rate of subclinical psychotic symptoms of 5% and a median incidence rate of 3%. Together with data from follow up studies, the authors concluded that the majority of these experiences (75 -90%) were transitory, disappearing over time.

Criticisms of the continuum hypothesis include the wide variation in prevalence of psychotic like experiences. One international study showed prevalence of at least one psychotic symptom in the general population to be from 0.8% in Vietnam to 45.8% in Nepal (Nuevo et al., 2010). Linscott and Van Os (2010) concluded from a systematic review of the literature that the variation was due to methodological and design issues, but also differing thresholds for psychosis. The studies often lack detail, with crude questions about symptoms which are then not followed up for clarification, and there is little content analysis of hallucinations (Sommer, 2010). The issue of distress is important in psychosis, and not one that is necessarily present in psychotic like experiences in the general population (Murphy et al., 2010). A study by Daalman et al (2010) found that non clinical voice hearers never experienced critical or intrusive voices causing them distress, whereas psychotic individuals experienced a strong negative emotional content to their auditory hallucinations. Yung et al (2009) has questioned whether all psychotic like experiences are the same, suggesting that some may signal a vulnerability for mental ill health, whereas others may be harmless. Their study of psychotic like experiences in a sample of 875 adolescents found that certain types of experiences (persecutory ideation, perceptual abnormalities and bizarre experiences) were associated with distress, depression and poor functioning whereas others were not (magical thinking). The study did not explore reasons for distress. It may be that the former experiences are perceived as stereotypical signs of madness and so the distress is due to fears of how they may be viewed by other people, rather than the symptoms themselves, whereas the latter experience is commonly accepted. Prevalence of paranormal beliefs, for example, is over 50% in surveys taken across the world, including the UK (Dein, 2012).

Other critics have noted that while rates of psychotic like symptoms in general populations can be quite high, rates of psychosis are low suggesting that the continuum categorical debate is too simplistic (Kaymaz and Van Os, 2010; David, 2010). Support for this idea has come from longitudinal studies which examine clinical outcome at follow up of individuals with psychotic like experiences, as well as observing pre-morbid characteristics of individuals who develop schizophrenia. The Dunedin study, for example (Poulton et al. 2000), carried out in New Zealand, involved a prospective birth cohort in which 761 children aged 11 underwent diagnostic interview about delusional beliefs and hallucinatory experiences and were followed up at aged 26 years. Collateral data was also collected at the final follow up. They found that self reported psychotic symptoms at age 11 incurred a very high risk of a schizophreniform disorder at age 26 years (odds ratio, 16.4; 95% Confidence Interval, 3.9-67.8). Further data from the Dunedin study using follow up data up to the age of 38 years found that psychotic symptoms aged 11 predicted higher rates of research diagnoses of schizophrenia and post traumatic stress disorder as well as suicide attempts. Importantly they found that very few of the 11 year olds reporting symptoms were free of mental disorder at aged 38 (Fisher et al., 2013). The authors note that psychotic symptoms at baseline were not specific to a diagnosis of schizophrenia but rather appear to act as an indicator of mental health problems in adulthood.

The research does support the notion that clinical psychosis emerges from the pool of people who experience psychotic like symptoms (Allardyce et al., 2007). A recent prospective study by Smeets et al. (2012) carried out in Germany examined the link between perceptual abnormalities, delusional ideation and the development of psychosis. They followed up 2524 adolescents and young adults for 10 years investigating the sequence and link between hallucinations and their role in the generation of delusional ideas. They concluded from their study that environmental factors, such as childhood trauma, may be the mediators between those who experience hallucinations and go on to develop delusional ideation. They suggest that the early stages of psychosis are characterised by hallucinations, which mediated by

social risk factors and affective dysregulation, are then complicated by delusional ideas, causing a persistence in symptoms which incurs the higher risk for transition. Recent work points to a five factor model of psychotic symptoms which encompass positive symptoms, negative symptoms, cognitive disorganisation, mania and depression (Reiningaus et al., 2012; Demjaha et al., 2012). Part of at risk mental state criteria is based on the premise that the threshold for psychosis is at the high end of a continuum in terms of symptom severity, frequency and duration (Yung et al., 2009). Kaymaz and Van Os (2010) have proposed that the higher end of the continuum is characterised not just by a clustering of psychotic like experiences, but also by other psychopathology (mood disorder, negative symptoms and functional decline), as well as a background of psychological and developmental difficulties which date back to childhood.

3.4. Pre-morbid characteristics

Studies of individuals who develop schizophrenia suggest a complex pre-morbid picture that starts early in life. Children who go on to develop schizophrenia often experience difficulties in reaching developmental milestones (Hollis, 1995; Jones et al., 1994); have poor co-ordination (Crow et al., 1995); high levels of anxiety (Crow et al., 1995; Jones et al., 1994); present with social deficits such as abnormal suspiciousness and relationship difficulties (Malmberg et al., 1998; Cannon et al., 2001; Dworkin et al., 1993), hostility (Crow et al ., 1995); problems with concentration (Crow et al., 1995); language impairments (Hollis, 1995; Crow et al., 1995); poor academic performance (Davies, 2007; Jones et al., 1994). Schizoid and schizotypal personality traits which are characterised by social withdrawal are strongly associated with poor pre-morbid adjustment and greater risk of development of schizophrenia (Willinger et al., 2001; Rodrigues Solano and Gonzalo de Chavez, 2005). In studies of individuals with at risk mental state, schizotypal personality disorder is associated with transition to psychosis in 30% of cases (Johnstone et al., 2005; Cannon et al., 2008). The disorder encompasses both the negative symptoms of social isolation associated with schizoid personality disorder, and the positive symptoms of

paranoia and referential type ideas associated with psychosis (Esterberg et al., 2010). However, there are concerns that it is unclear whether schizotypal personality disorder represents a separate disorder in these cases or whether it is part of the prodrome (Esterberg et al., 2010). Strauss (1977) has speculated that pre-morbid difficulties in childhood and adolescence may be an early clinical manifestation of psychosis and therefore part of the psychosis prodrome. However, Davidson (2001) has argued that pre-morbid features are not uniform enough to provide a typical prodrome picture despite their frequent occurrence. He also notes that the course between pre-morbid to prodrome is not easily divided into identifiable phases (Davidson, 2001). Nevertheless, they do provide a developmental context which may be useful when trying to understand the way in which some people who experience psychotic like symptoms are at higher risk for psychosis than others.

3.5 Conclusion

Conceptualisation of psychosis is based on a threshold which creates an artificial boundary between normal and abnormal mental health. This threshold is defined by the diagnostic manuals, DSM-IV-TR and ICD-10, but such are the questions over the criteria validity, that there is variation even between the manuals as to the demarcation between different psychoses. Nevertheless, the utility of psychosis as a categorical construct ensures its continued use despite the strong evidence that psychotic like symptoms exist on a continuum across the population. Psychosis is thought to be at the extreme end of the continuum but the factors which cause advancement towards psychotic level symptoms are not properly understood. Among the questions that remain unclear are whether pre-morbid characteristics which date back to childhood and adolescence are developmental markers associated with psychosis or whether they form part of the prodrome. The evidence suggests that individuals who become psychotic have a range of psychopathology including affective disturbance and functional decline and show early social and academic difficulties indicating developmental abnormalities. Together with bio-psycho-social factors the risk of developing psychotic symptoms associated with distress increases. It is the persistence

of such symptoms within the context of distress, as measured by functional decline, which appeared in early accounts of the psychosis prodrome and which is now conceptualised as part of the at risk mental state. The next chapter will focus on the evolution of preventative services which occurred following the findings in the continuum literature combined with growing concerns over the impact of delayed treatment for psychotic symptoms. Early intervention of people experiencing their first episode of psychosis emerged as a sensible response, which in turn led to early detection with a view to identifying people before they had reached the threshold for psychosis.

Chapter 4: Background to ARMS

This chapter will lay out the background to the evolution of the At Risk Mental State research and services.

4.1 Introduction

As noted in the previous chapter, the notion that individuals who develop psychosis do so over time with a gradual increase in symptoms and decrease in functioning is not new. Descriptions of a psychosis prodrome can be found in the works of Kraeplin (1896), Sullivan (1927), and Bleuler (1950). Even Schneider (1959) who disagreed with the idea of gradual onset of symptoms, described a psychotic state as often being preceded by a 'delusional atmosphere' although he considered the sensation to be so vague as to offer little understanding of the later psychotic experience (pp.109). However, the development of ARMS as a model for treatment came much later in the 1990s, driven by the research which had found an association between duration of untreated psychosis and treatment outcomes (clinical, functional and biological). Those investigations led to a service model backed by government policy aimed at improving prognosis in individuals with first episode psychosis. Investigators examining duration of untreated psychosis soon extended the definition to duration of untreated illness which included the prodrome period. At about the same time, systematic studies using retrospective data to identify prodromal characteristics were being published which revealed a consistent picture and one that confirmed the earlier case study observations in the literature (Norman and Malla, 2001; Marshall et al., 2005). The challenge then became whether this information could be used to predict psychosis, and so theoretically prevent psychosis. This immediately gave rise to a number of ethical issues which included: impact on the individual being told they were showing prodromal signs of psychosis; treatment options; and the need to offer ongoing support to such an individual. The result was the simultaneous establishment of a handful of services worldwide which were both driven and developed by the

translational research into psychosis prodrome. This chapter will give an overview of the duration of untreated psychosis/duration of untreated illness findings, the literature on retrospective studies of prodrome, the conceptualisation of ARMS as opposed to prodrome, before detailing the development of ARMS criteria, and lastly some of the methodological issues surrounding the ARMS literature.

4.2 Delayed Intervention

The NHS Plan (Department of Health, 2000) laid out a plan of service development which included the establishment of fifty Early Intervention Teams by 2004. The teams would target individuals aged between 18-35 years who were experiencing their first episode of psychosis. This service development followed a decade or so of research that had firmly established an association between untreated psychosis and treatment outcomes. It had started with a study by Crow et al. (1986) which followed up 120 patients over two years in a randomised controlled trial examining effect of neuroleptic medication versus placebo on relapse. The study found that the most important predictor of relapse was duration of untreated psychosis. This was followed by a review of 22 studies investigating the influence of neuroleptics on the course of schizophrenia by Wyatt (1991) which further endorsed this finding. Wyatt then speculated on the possibility that untreated psychosis was somehow 'toxic to the individual beyond the immediate episode' (pp.347), with each psychotic episode resulting in cumulative damage to the brain. McGlashan (2006) has commented that this paper led to two central ideas which were at the heart of a large volume of research which emerged in the decade that followed. The first is that treatment was effectively defined as treatment with medication (anti-psychotic medication), and the second was that the possibility of untreated psychosis could have a harmful effect on the brain, resulting in deficits that would be difficult from which to fully recuperate. A year later, Loebel et al. (1992) published a paper also examining outcome in 70 first episode patients who had been followed up over a year. Among the factors they examined was duration of untreated psychosis, but in addition, they expanded the duration of untreated psychosis to duration untreated of illness, and included the prodrome stage. They found

that both duration of untreated psychosis and duration of untreated illness were associated with longer time to remission and less remission.

The work published since then has educed consistent but not unequivocal results of an association between duration of untreated psychosis/duration of untreated illness and prognostic outcomes. Long duration of untreated psychosis has been found to be associated with poorer quality of life (Carbone et al., 1999); more positive symptoms (Barnes et al., 2008); more negative symptoms (Barnes et al., 2008; Niklas et al., 2010); and lower levels of social functioning (Perkins et al., 2005; Barnes et al., 2008). A systematic review by Marshall et al. (2005) found a significant association between duration of untreated psychosis at six and 12 months and total symptoms, depression and anxiety, negative and positive symptoms and overall functioning. The association between duration of untreated psychosis and brain morphology was supported by Magnetic Resonance Imaging (MRI) investigations which found gray matter abnormalities to be associated with duration of untreated psychosis (Lappin et al., 2006; Penttilä et al., 2010). However, other investigators found no association between duration of untreated psychosis and functional outcomes as measured by quality of life (Shrivastava et al., 2010); level or type of symptoms, relapse (Shrivastava et al., 2010; de Haan et al., 2003); course of illness, clinical outcomes (Craig et al., 2000); or brain deficits (Hoff et al., 2000). A review by Norman & Malla (2001) concluded that there was no evidence of a link between duration of untreated psychosis and probability of relapse. However, Perkins et al. (2005) found that evidence for the link between time to treatment and relapse was mixed, but in those studies where an association was found, it was mediated strongly by maintenance of anti-psychotic medication. In a later systematic review of early intervention treatments (both pharmacological and psycho-social), Alvarez-Jimenez et al. (2009) concluded that a specialist early intervention approach was effective in preventing relapse.

Both Marshall's et al. (2005) and Norman & Malla's (2001) reviews concluded that that while the evidence of an association between duration of untreated psychosis and outcomes was consistent, it was also correlational and not causal. Among the issues was whether a shorter duration of untreated psychosis was due to an acute onset and better pre-morbid functioning therefore leading to a better outcome than those patients who had had an insidious onset with worse pre-morbid functioning which had led to a delay in help seeking. However, authors of systematic reviews who had examined pre-morbid functioning as a confounding variable had reported an association between long duration of psychosis and poor outcome independent of pre-morbid functioning (Perkins et al., 2005; Marshall et al., 2005). The other possibility was that earlier treatment in some way prevented or reduced the development of the illness becoming chronic, thereby improving outcomes (McGlashan, 1999). There was a recognition that early intervention could prevent further deterioration of functioning and a decline in mental health which could also limit other damaging behaviours such as suicide (McGlashan, 1999).

The methodological problems within the duration of untreated psychosis literature begin with the fundamental questions of defining the key concepts, onset of psychosis and onset of treatment (Norman & Malla, 2001; Polari et al., 2009). Some investigators broaden the duration of untreated psychosis to duration of untreated illness, therefore including the prodrome phase of lower threshold symptoms. It is unclear how the line is drawn between prodrome and psychosis to measure the duration from one to the other and then to onset of treatment. Parnas (1999) noted that 'the course of schizophrenia is not always amenable to sharp divisions into definable phases'. If onset of psychosis is measured by onset of symptoms, then the question remains of what to include as a symptom, that which is experienced subjectively by the patient but is not necessarily noticeable by others, or that which is observable by others (Norman & Malla, 2001). In addition, there is the question of defining onset of treatment. Polari et al. (2009) noted in their editorial that only two studies define onset of treatment as adherence to treatment or response to treatment. They observe that full engagement with services and interventions

can take place over a period of time, and that the duration of untreated psychosis may well be even longer than initially supposed due to lack of adherence. Marshall et al. (2005) commented that only two studies used researchers examining outcomes that were blind to information about duration of untreated psychosis. Furthermore, there has been a lack of investigation into possible confounding factors which may influence both duration of untreated psychosis and prognosis such as lack of social support, social withdrawal, lower level education (Norman & Malla, 2001). McGlashan (2006) has also criticised the neurotoxic theory, saying that there is no evidence of an increase in the severity of symptoms or symptoms becoming more treatment resistant with each episode which is what would be expected with a cumulative effect on the brain.

The duration of untreated psychosis literature laid the foundation for early intervention which aimed at reducing the time between first psychotic symptoms and treatment, and continued intervention for the first three years after diagnosis. The need for an early treatment model was further supported by criticisms of inadequate services, in particular for young people, which were viewed as stigmatising and pessimistic of recovery (Joseph & Birchwood, 2005; French et al., 2010). This coincided with the recovery movement which questioned the notion that individuals with severe mental illness could not recover and lead fulfilling social and occupational lives. Central to the approach was empowerment of individuals using the services, engendering a sense of optimism and aiming to reduce stigmatising constructions of psychotic experiences (Corin & Louzon, 1992, Warner, 2010). Promotion of recovery and reduction of stigma were deemed key components of the early intervention approach. Following the NHS Plan (2000), the Mental Health Policy Implementation Guide (Department of Health, 2001b) set out the aims of Early Intervention Teams. They were to i) reduce stigma and raise awareness of symptoms of psychosis and to reduce the duration of untreated psychosis ii) develop engagement and promote recovery for young people iii) work across the divide between child/adolescent services and adult services in partnership with primary care, education, social services, youth and other services. Additional backing came from

NICE (2002) who recommended development of early intervention services to everyone in first episode psychosis regardless of age.

4.3 The Psychosis Prodrome

The natural extension of the early intervention model was to detect and intervene even earlier, while the individual was still in the pre-psychotic phase and prevent them reaching psychosis level symptomatology. The idea was not new. Descriptions of psychosis prodrome had long been documented in the literature and various investigators had mooted the idea of targeting the prodromal phase for treatment (Sullivan, 1927; Meares, 1959; Docherty et al., 1978; Falloon, 1992). That most psychotic individuals experienced a prodromal phase was not in question, the issue was whether the symptoms could be reliably identified and characterised (Keith and Matthews, 1991).

Early studies documented detailed descriptions of psychosis prodrome based on retrospective interviews with patients and their families after the patient had experienced their first psychotic episode. Bowers (1968) for example carried out interviews with fifteen patients in the few weeks following their first admission for acute schizophrenia. He reported that patients had initially denied any precipitating period, commonly saying their breakdown had 'come out of the blue', but on exploration clear affective and cognitive changes prior to frank psychosis were elicited during the interviews. A sense of heightened awareness was usual 'my senses seemed alive, colours were very bright'. Their sense of self was also intensified. The patient would perceive hidden meanings in the world around them, and make connections between how they felt and what they perceived, all in relevance to the self. As the psychotic process ensued, the intensified sense of self would disintegrate and the patient would experience the opposite, 'a loss of the sense of self'. Delusions evolved essentially as attempts to make sense of these experiences.

The range of symptoms documented in early accounts was broad but consistent. Cameron (1938) who carried out retrospective interviews with 100 patients experiencing their first episode of psychosis and their significant others listed sleeplessness, moodiness, impatience, depression, lack of concentration, lack of energy, irritability, loss of friends, loss of interest as early non-specific symptoms of schizophrenia. Symptoms that he thought were specifically indicative of impending psychosis included: being talked about, watched, being doped, a lack of feeling of familiarity, fears of violence and odd somatic experiences. Chapman (1966) in a study involving retrospective interviews with 40 patients experiencing their first episode of psychosis described disturbances of visual perception, thought blocking and other cognitive disturbances, problems with speech, the use of gesturing, disturbances of movement, emotional reactions and development of delusions. Bleuler (1950) noted 'there are early character anomalies which can be demonstrated by careful case histories in more than half the individuals who later become schizophrenic: the tendency to seclusion, withdrawal, together with moderate or severe degrees of irritability' (pp.252).

In a review of this early literature, Docherty et al. (1978) identified five stages in the development of schizophrenia. The process started with persistent feelings of anxiety, irritability and preoccupation. This was followed by feelings of anhedonia, apathy, social withdrawal and feelings of hopelessness, before the person went on to 'act out', taking uncharacteristic risks. Stages four and five were psychotic breakdown and then recovery, in which the individual regains insight. The notion of psychosis being just one of a series of stages had been advanced by Klaus Conrad (1905 – 1961). Conrad had proposed that onset of psychosis occurs over three broad phases which he called trema, apophany and anastophe. The first, characterised by delusional mood could last days, months or even years. The person would feel an increasing sense of foreboding, and objects normally in the perceptual background would acquire salience. This would be followed by the individual feeling that they have access to secret meanings in their surroundings, and an increasing sense of paranoia. Finally, when the person experiences psychosis

they feel themselves to be at the centre of activity and powerless to influence or reject such attention, the formation of delusions being the final phase of the process.

The stages model highlighted two issues which were most likely connected. Firstly, whether some symptoms were part of the prodrome or whether they were a response of the individual being aware that they were becoming unwell. Secondly, whether there was a consistent order in which prodromal symptoms appear, indicating advancement towards psychosis. Chapman (1966) had reported that most patients experienced intense anxiety in the early stages of illness and believed this to be in response to their symptoms rather than part of the illness itself. Depression was also common. Affective symptoms had been recognised from early on and had raised the question of whether they formed part of the prodrome or whether as Chapman believed they were reactions to the prodrome. Bleuler (1950) had commented that 'the fundamental affective symptoms often dominate the picture from the very start, in that the patients become increasingly indifferent and apathetic...chronic as well as acute depressions are found more frequently in the beginning of an outspoken illness than any other syndromes' (pp.254). Sullivan (1927) had attempted to distinguish depression in psychosis prodrome from depression as an illness in itself.. 'true depression is preoccupied with thoughts of the enormity of disaster, punishment, hopelessness ...the incipient schizophrenic is more wrapped up in fantastic explanation and efforts at remedy'.

4.4 Evolution of At Risk Mental State

Later systematic studies sought to clarify these issues. Hafner et al. (1992a) developed the IRAOS (Instrument for the Assessment of Onset and Early Course of Schizophrenia). The IRAOS was designed to address the problem of validity and reliability of retrospective assessment which necessarily relied on recall by patients and their relatives. The semi-structured interview which included a time coding frame

was used in a series of studies with large samples (minimum 230 participants) to examine type and order of symptoms in early schizophrenia. The studies showed the early stages of schizophrenia to be characterised by depressive, negative and non-specific symptoms. (Hafner et al., 1992a, 1992b, 1993, 1999). Hafner et al. (1999) concluded that depression formed part of schizophrenia symptomatology on the basis that depression emerges at such an early stage that it cannot be a reaction to other unusual symptoms and to the fear of becoming unwell. The finding that affective disturbances are characteristic of the early prodrome of schizophrenia was consistent in the literature (Hambrecht et al., 1994; Beiser et al., 1993). The literature established that negative, depressive and non-specific symptoms made up the early prodrome. These continued and increased over time as the person approached psychosis threshold. Positive symptoms emerged later overlapping with negative symptoms but also increasing as acute psychosis neared (Hafner et al., 1992a, 1992b, 1993, 1999; Hambrecht et al., 1994).

Notably throughout the literature, a prodrome was reported by almost all the participants. The sudden onset of acute psychosis with little or no pre-existing signs or symptoms leading up to the episode was virtually unknown. Some exceptions were reported: Beiser et al.'s (1993) described a range of prodrome from 0 to 20 years; Yung and McGorry (1996a) gave a range of 3 days to 6 years, but these are rare. On the whole, the literature was consistent in finding prodromes of long periods, usually years. Loebel et al. (1992) found a duration of untreated psychosis of 52 weeks, but when they included the prodrome this led to a duration of untreated illness of 151 weeks. Moller and Husby (2000) in their study gave a prodrome range of 1 week to 11 years. They stated that participants described distinct subjective changes long before others around them noticed any differences in appearance or behaviour that gave cause for concern. They concluded that the 'silent' part of the early prodrome probably lasted for years. Other studies found prodrome ranges of five years (Hafner et al., 1992b) to 15 years (Hafner et al., 1993).

The research into premorbid characteristics of patients with schizophrenia suggests a developmental aspect which may form part of the prodromal profile (Strauss, 1977). To date it is unclear whether cognitive and behavioural difficulties, and schizotypal traits in children and adolescents, are a pre-morbid phase that require triggers to become prodrome or whether they are a continual process of deterioration (Davidson, 2001). Regardless, the indications were that there is a long process to development of full psychosis which naturally raised the question of whether it was possible to interrupt the process and if so how to do so.

The idea of preventing psychosis had already been put to the test by Falloon (1992). He carried out a study in a semi-rural area just outside London with a population of 35,000, 20,000 of whom were aged between 17 and 65 years. Falloon based the approach on a stress vulnerability model derived from Zubin and Spring (1977). The idea behind the approach is that an individual's risk of becoming mentally unwell was rooted in the interaction between biological and psychosocial risk factors. An episode of psychosis is the result of physiological changes brought on by the individual's vulnerability threshold being exceeded. The aim of early detection is to raise the threshold thereby preventing psychosis (Falloon 1996). The study took a two phase approach to identifying participants. First, general practitioners (GPs) were trained to recognise possible prodromal signs and symptoms. They would then refer to Falloon's team for the person to undergo a detailed mental health assessment. For those individuals thought to be in the prodromal phase of schizophrenia, a comprehensive intervention strategy was implemented. There was an emphasis on therapeutic alliance to encourage open dialogue and to address and reduce fears about schizophrenia. An assessment of major stress factors was carried out with a view to identifying and resolving those factors triggering the prodrome. Participants were given education about schizophrenia, healthy lifestyle and problem solving skills. Ongoing support was offered to both participants and their carers based on their reported need. In addition, low doses of neuroleptic medication were given in some cases for short periods of time and for specific problems.

The authors reported a tenfold reduction in incidence of schizophrenia during the period of the project and also commented that the service was well received by the community.

Proponents of the approach saw the benefits of intervention at this early stage as numerous. McGorry, Yung and Phillips (2003) favoured the model on the basis that it offered help to individuals who were withdrawing socially, declining in function and experiencing distress, regardless of whether they reached threshold level of psychosis. In addition they argued that early intervention promoted engagement and trust laying the foundation for future therapeutic relationships; the aim would be to prevent psychosis, but also, when that was not possible to improve prognosis by reducing the duration of untreated psychosis; co-morbidity could be addressed; and lastly it would allow the prospective study of development of psychosis. McGorry et al. (2006 and 2010) has argued that a clinical staging model is a more useful way for addressing the needs of emerging and evolving symptoms in young people compared to the current diagnostic model. The authors describe current diagnostic categories as being more accurately seen as outcome variables as they are based on samples of people who are chronically unwell and under the care of tertiary services. They are the endpoint for full progression in mental ill health. A clinical staging model would aim to provide a detailed description of the clinical picture with associated risk factors (biological, social and personal) of a person at each stage of the continuum. The approach is based on two premises: first, that earlier intervention yields a better response and a better prognosis than later intervention and secondly, that earlier intervention should have less risks and more benefits than later intervention. However, the notion of early detection raised profound ethical questions. The concept of screening for potential disorders was already well established in mainstream medicine (e.g. cardio vascular disease, breast cancer screening) where there was recognised aetiological evidence. Risk factors in psychiatric disorder were neither clearly characterised nor understood, provoking a strong debate between the risks and benefits of such an approach (McGorry, Yung and Phillips, 2003). Identifying individuals with 'potential' psychosis carried the risks of labelling and

treatment of such individuals; the associated anxiety and stigma of such a model. In addition, how would such individuals be identified; and how could the number of false positives be limited in order to avoid unnecessary treatment (Yung and McGorry, 1996b; McGorry, Yung and Phillips, 2003).

Central to the debate was the conceptualisation of the prodrome. Falloon (1992a) himself had observed that the prodrome consisted of a broad range of symptoms, almost none of which were specific to schizophrenia. Some authors argued that since the prodrome originates in the medical literature of infectious diseases, its use in psychiatry should have corresponding characteristics to those in medicine (Malla and Norman, 1994). In medicine, the prodrome refers to the initial stage of disease in which general non specific symptoms appear (e.g. fever, aches and pains). The prodrome ends when the specific symptoms of the illness emerge (e.g. a particular type of rash). Others believed that a more prudent approach was for there to be a clear indication of psychosis before labelling and intervention of the individual (Yung et al., 1996b). Even the term 'prodrome' was criticised as flawed and pessimistic. A retrospective concept, it refers to an early phase of an illness, and can only be named as such once the illness manifests itself. The term At Risk Mental State (ARMS) was coined by McGorry and Singh (1995) as more accurate in that it described a state in which the person is at increased vulnerability for developing psychosis, but development of psychosis is not inevitable. As a result two distinct approaches emerged. The first, known as the Basic Symptoms Concept (BSC), was based on the work of Gerd Huber carried out in the 1960s in Germany. In interviews with patients experiencing psychosis relapse, Huber elicited descriptions of subtle subjective experiences which the patient identified as deficits but which were not noticeable in their behaviour or appearance (Gross and Huber, 2010).

The Basic Symptoms Concept was laid out in detail in the 178 items of the Bonn Schedule for the Assessment of Basic Symptoms (BSABS; Original Version in German, Gross et al., 1987; English Version,

2008). They comprised of disturbances in thinking, attention, perception, memory, movement and speech (Gross and Huber, 2010). The BSABS was first used in the Cologne Early Recognition Study (CER) in 1987 to assess and follow up patients thought to be prodromal with a view to examining predictive validity of the BSABS. Of 160 patients followed up over 9.6 years, 79 (49%) developed schizophrenia. Of the 79, 77 had reported at least one Basic Symptom at initial assessment. Of the 81 participants that did not go on to develop schizophrenia, 33 had reported at least one BS at baseline assessment (Klosterkotter et al., 2001; Schultze-Lutter et al., 2012). These participants reported either complete remission of symptoms within the first few weeks or following several fluctuations over the course of the follow up period. A later study involving 96 patients followed up over eight years yielded a transition rate to psychosis of 58%. Two thirds of the patients who reported basic symptoms at baseline developed psychosis, while no transitions were observed in patients without basic symptoms (Klosterkotter et al., 1997).

An analysis of single BSABS items in the CER study revealed ten items to have good predictive accuracy. This led to the development of the Cognitive-Perceptive Basic Symptoms (COPER) Criteria (Schulze-Lutter et al., 2007). Further analyses then showed a cluster of nine basic symptoms to be the most predictive basic symptoms. This list led to the Cognitive Disturbances Criteria (COGDIS; Schulze-Lutter et al., 2007), five of which overlapped with COPER criteria. Items for both the COPER and the COGIS are shown in Table 2 along with their transition rates.

Table 2: COPER and COGDIS Criteria and Transition Rates

COPER	COGDIS
Thought interference	Thought interference
Thought pressure	Thought pressure
Thought blockages	Thought blockages
Disturbances of receptive speech	Disturbances of receptive speech
Unstable ideas of reference	Unstable ideas of reference
Derealisation	Inability to divide attention
Decreased ability to discriminate between ideas and perception, fantasy and memory	Disturbance of expressive speech
Visual perception disturbances	Disturbances of abstract thinking
Acoustic perception disturbances	Captivation of attention by details of the visual field
Transition rates	
First year 20%	First year 24%
Second year 17%	Second year 22%
Third year 13%	Third year 15%

(Schulze-Lutter et al., 2007)

Basic symptoms were thought to precede negative symptoms (Gross and Huber, 2010). They differed from negative symptoms in their absence of outward manifestation. The experience is purely subjective e.g. 'I thought about my grandparents. Then a weird thing happened: I couldn't remember if I knew my grandparents properly, if they were real or if they were just in my imagination. Did I know them, or had I made them up?' (Example of Decreased ability to discriminate between perception and ideas, fantasy and memory, from Schultze-Lutter, 2009). In addition, the individual recognises the implausibility of the experience 'When I was listening to the radio the idea that the lyrics had some special meaning for me suddenly popped up into my head. Of course I knew straight away that it was just my imagination, a kind of weird thing. I did not have to think twice about it to know that' (Example of Unstable ideas of reference, from Schultze-Lutter, 2009).

The basic symptom criteria had good predictive qualities. However, they were based on non specific symptoms and transitions occurred over long follow up periods. The threat of unnecessary labelling and treatment, based on symptoms which were so generic, raised the prospect that the risks outweighed the benefits. In response to concerns of unwanted labeling, a 'close-in' strategy was proposed. The concept was based on Bell's (1992) recommendation that for an individual to meet criteria for inclusion they should meet a number of conditions which would indicate a high level of risk for psychosis. The strategy was translated into practice in Melbourne in 1994 with the establishment of the Personal Assessment and Crisis Evaluation (PACE) Clinic. PACE's intake criteria was developed from literature reviews and clinical experience of patients with first episode psychosis and underwent regular review and evaluation (Yung et al., 2003). The 'close-in' strategy sought to identify those who were at the age of peak risk, who were already experiencing sub-threshold specific psychotic symptoms, and who were help seeking. Individuals meeting these criteria were thought to be at Ultra High Risk (UHR) for psychosis (Yung et al., 2003). The aim was to decrease the risk of the individual being a false positive, address their distress, and offer an optimistic model of intervention (McGorry, Yung and Phillips, 2003). In terms of symptomatology, UHR criteria is focused on the positive symptoms of psychosis, and were therefore specific to the illness. UHR is based on the premise that psychotic symptoms lie on a continuum (Strauss, 1969) and that threshold for illness is at the high end of the continuum of symptom severity, frequency and duration (Yung et al., 2009).

UHR criteria was operationalised with the Structured Interview for Psychosis (SIPS; Miller et al., 1999) and the Comprehensive Assessment for At Risk Mental State (CAARMS; Yung et al., 2005). The CAARMS was derived from a combination of the psychotic dimensions of the Brief Psychiatric Rating Scales (Overall and Gorham, 1962) and the measures of intensity of psychotic like experiences in the delusional scales of the Comprehensive Assessment of Symptoms and History (CASH; Andreasan, 1987). Criteria to measure frequency and duration of experiences were also added, in addition to recency of

symptoms. These scales were also used as a basis from which to develop the cut off points for both UHR and psychosis threshold. The CAARMS implemented the UHR symptomotology in three criteria: i) attenuated psychotic symptoms (APS). These are positive psychotic symptoms which are experienced at a lower level of intensity, frequency and/or duration than at threshold level for psychosis ii) Brief Limited Intermittent Psychosis (BLIPS), an experience of threshold level psychosis which lasts less than seven days and from which recovery is natural and medically unaided iii) vulnerability criteria whereby the individual has a first degree family history of psychosis or schizotypal disorder as well as a recent significant drop in functioning lasting longer than a month. An individual within the age range 14-30 years, experiencing any one of these criterion would be considered UHR for psychosis.

The SIPS is a similar diagnostic schedule developed and used by the North American Longitudinal Study (NAPLS; Addington et al., 2007). It also assessed UHR based on the same three criteria using the Scale for Prodromal Symptoms (SOPS) to evaluate severity of symptoms; a schizotypal personality disorder assessment; family history; and an assessment of functioning. While the SIPS and the CAARMS are similar, there are differences which impact on inclusion criteria and may therefore also influence outcome. The differences are highlighted in a case example by Fusar-Poli and Van Os (2012), in which a patient is accepted for treatment by an early detection team based on CAARMS criteria of a BLIP. A BLIP as defined by the CAARMS comprises of up to seven days of full psychotic symptoms, followed by spontaneous remission, occurring in the last twelve months, and impacting strongly on functioning. SIPS criteria for a BLIP are psychotic level symptoms for up to a month, followed by spontaneous remission, occurring in the last three months, with no serious impact on functioning. If functioning is severely affected, the threshold for duration drops to just one day in a month. The authors point out that such discrepancies would have meant that the patient may have been diagnosed as 'normal, at risk of psychosis, or already frankly psychotic' depending on diagnostic approach. This in turn would have resulted in 'no treatment, psychological support or anti-psychotics respectively'. Although the BS and

UHR began as distinct approaches, they have now been integrated with symptoms from the BSABS having been included in the CAARMS and the SOPS (Schultze-Lutter et al., 2010).

A number of screening tools for ARMS have also been developed. They include the Prodromal Questionnaire a 92 item self report screening tool for prodromal and psychotic symptoms(Loewy et al., 2005); the briefer version of the same with 25 items (used in this study; Loewy et al., 2011), the PROD-screen (Heinimaa et al., 2003), as well as the SIPS Screen (Miller et al., 2004). These have used the SIPS (Miller et al., 2003) to test for concordant validity and have achieved high levels of sensitivity (between 80% in the PROD-screen to 90% in the PQ and the SIPS screen) as well as good specificity (49% in the PQ to 100% in the SIPS screen). However, with the exception of the PROD-screen which was tested in a random GP sample, they have all been tested in help seeking populations. In addition to these tools, there is also the Self-screen-Prodrome (SPro; Müller et al., 2010) which was validated using the Symptom Check List – 90 - Revised (Derogatis, 1977; an instrument which measures psychological distress along a range of dimensions including psychoticism); the Early Detection Primary Care Checklist (PCCL) designed for use by primary care clinicians and based on concordant validity with the CAARMS (French et al., 2012) and a 16 item version of the PQ with 87% for both sensitivity and specificity also based on concordant validity with the CAARMS (Ising et al., 2012) and tested on a sample of patients who were help seeking for non psychotic disorders.

Transition to psychosis has been the key outcome by which to measure the predictive validity of ARMS criteria. Initial transition rates appeared to demonstrate strong support for the concept. A systematic review by Olsen and Rosenbaum (2006) found transition rates of UHR samples varied between 9 and 54% depending on follow up interval, with almost all studies showing rates of more than 20% at the six month follow up. However, more recent studies have reported lower transition rates (Yung et al., 2006

and 2007). A meta-analysis by Fusar-Poli et al (2012b) of 27 studies carried out between 1996 and 2011, involving 2502 patients confirmed a decline in transition rates for the recently published studies, but found it was a modest effect. These authors reported an 18% transition rate at six month follow up, 22% after one year, 29% after two years, and 36% after three years. Studies which used a combined BS and UHR approach yielded transition rates of 23%, which was lower than either criteria alone. However, as with Olsen and Rosenbaum (2005) they also advised of a wide variety in transition rates not just between centres, but also within centres.

The high rate of false positives has caused concern, raising questions about the validity of the various ARMS criteria, and in particular the advisability of intervention in this population (Schultze-Lutter et al., 2012). Various reasons for the fall in transitions have been mooted: i) greater awareness of early detection services may have led to an increased recognition of psychotic like experiences (PLEs) which in turn has increased referral (Yung et al., 2006). Some of these may be those sections of the general population who experience PLEs without distress and are not actually at risk for psychosis (Linscott and Van Os, 2010) (ii) insufficient follow up time. What Yung et al. (2003) have referred to as the problem of 'false false positives', individuals who do not make transition within the time frame of follow up (usually a year or two years), and are thought to be false positives, but who in fact go on to make transition beyond the follow up time frame. Research has confirmed a significant number of transitions beyond two years of follow up (Fusar-Poli et al., 2012a; Fusar-Poli et al., 2012b) iii) treatment preventing or delaying psychosis onset. This can include social support, psychological and medical treatment of depression and anxiety which can reduce distress and act as protective from psychosis transition (Yung et al., 2007; French et al, 2007) iv) overlapping psychopathology with other mental disorders. There is growing evidence that individuals who are help seeking for attenuated psychotic symptoms are at increased risk for a variety of mental disorders not just psychosis (Werbeloff et al., 2012).

In addition, to these findings, other authors have examined non transition as an outcome and confirmed that the majority of individuals who are thought to be UHR for psychosis do not go on to become psychotic. A systematic review of the literature examining non transition found that on average 76% of UHR patients made no conversion during follow up periods ranging from 6 to 40 months (Simon et al., 2011). This review further confirmed the decline in transition rates in the more recent literature. Few studies reported rates of total remission but those that did had rates that varied between 15.4% and 54.3%. The literature on outcome for non converters is remarkably sparse. However, what does emerge is that an important proportion of help seeking individuals who access early detection services but do not make transition to psychosis are found to have other mental disorders. The NAPLS found that a high proportion of non-converters had mood and/or anxiety disorders, while a small group had emerging personality disorders (Addington et al., 2011). Similar findings were also reported by Simon and Umbricht (2010). Furthermore, there is a growing concern about individuals in these services who do not make transition to psychosis but remain low functioning and with poor quality of life (Yung et al., 2010; Fusar-Poli et al., 2012b).

It is not just transition rates that raise questions about the validity of the ARMS criteria, but also various methodological issues: i) a substantial amount of the literature concerns naturalistic designs in which cohorts are followed up in a service. This means that interventions are not controlled for, so within the sample some individuals may have received interventions including psychological therapy or even anti-psychotic medication but these individuals are not distinguished from those with no interventions (e.g. Yung et al., 2006) ii) The subtle differences between the differing assessments as highlighted by Fusar-Poli and Van Os (2012) may also have consequences for the broader outcomes of studies iii) The age intake range is broad across studies varying between 12 and 40 years (Olsen and Rosenbaum, 2006) iv) there is little breakdown in the groups in terms of transition risk for those with APS, or BLIPs or genetic risk (Olsen and Rosenbaum, 2006). This is despite some evidence that the risk of transition differs

between the groups with the BLIPs group being at highest risk of transition (Nelson et al., 2011). Valmaggia et al. (2012) has also found the different classes of symptoms incur different transition risks v) Small sample size. While there are some exceptions involving larger samples, the majority of studies involve ARMS samples of less than 100 patients (Olsen and Rosenbaum, 2006; Fusar-Poli et al., 2012a). This is problematic for detailed analyses as it does not allow the power to determine meaningful effects vi) referral sources vary across samples, with individuals taking part in studies, following self referral, referral from General Practitioners, or from other clinical teams. A sizeable number are referred from other mental health or psychological teams, which may signify higher levels of mental health problems for these patients vii) the ARMS profile is built from a help seeking population. Individuals who seek help have likely overcome barriers of stigma which may be an indication that they are in higher distress and therefore more unwell than those who do not seek help (Biddle et al., 2007). In addition, individuals who delay seeking help may resort to other coping strategies such as use of substances or self harm which may compound their mental health issues (Biddle et al., 2007).

4.5 At Risk Mental State in Prison

Prisoners are among the groups of populations who fail to seek help while in the community. At the time of reception, less than 50% have a GP (Social Exclusion Unit, 2002). When this study began, it was the first of its kind as far as the authors were aware of examining prevalence and correlates of at risk mental state among prisoners. There is high prevalence of psychosis among the prison population as reported in Chapter One and it is substantially higher compared to the general population (5.2% vs 0.4%, Brugha et al, 2005). An investigation of ARMS among the prisoner population raises particular issues that have not been addressed before. The assessment is aiming to tap into anomalous experiences in a population where up to a third meet criteria for paranoid personality disorder, 23% for borderline personality disorder, 2% for schizotypal personality disorder, 66% have hazardous drinking levels, between a third and a half of receptions to prison are problem drug users (UKDPC; United Kingdom Drug Policy

Commission, 2008). Prison is perceived to be a hostile environment even for those for whom it is not their first time. Distress levels in the first week of reception to prison both from court, but also following transfer from another prison are recognised to be so high that special procedures are in place to help keep people safe from harming themselves during this time (Fazel et al., 2008; Rivlin et al., 2010). In addition they come in with a degree of vulnerability having already experienced adverse life events which are in themselves risk factors associated with psychosis. Almost a quarter (24%) of prisoners have been in care as a child, 42% having been permanently excluded from school, 15% homeless upon reception to prison (Williams et al., 2012b), 68% were unemployed prior to reception, and 13% of these had never had a job (Hopkins, 2012), indicating that this is a group with low long term social functioning as measured by the standard assessment tools. HMP Brixton is a remand prison serving the local courts. It is situated in an area of South London in which the incidence of psychosis is probably one of the highest in the world (Kirkbride et al., 2008).

4.6 Conclusion

Early detection emerged as an extension to early intervention in first episode psychosis which in turn came about due to concerns over prognosis following delayed treatment of symptoms. Detailed accounts of a psychosis prodrome had existed in the literature since the early years of psychiatry. Later systematic retrospective studies confirmed a consistent but not altogether uniform profile. This work led to prospective studies which attempted to create a profile of individuals who were most likely to develop psychosis. In recognition of the notion of increased likelihood rather than certainty of developing psychosis, the description at risk mental state was proposed and services were developed to work with individuals who sought help and who met criteria for being at risk of psychosis. Two conceptualisations emerged of the at risk mental state, each with their own criteria.

The Basic Symptoms approached focused on general non-specific but persistent symptoms, while the Ultra High Risk approach focused more on positive symptoms which were thought to be indicative of imminent transition to psychosis. In the initial years of early detection, transition rates to psychosis of those with an at risk mental state was over 40% indicating that these individuals were indeed at high risk for psychotic disorder. However, since then transition levels have fallen to as low as 15% raising ethical and practical concerns about the model. There are many plausible explanations for the decrease in transition rates, as well as findings that show outcomes of other mental disorder for those that do not make transition to psychosis. One of the major flaws in the at risk mental state literature is that the profile is built from help-seeking populations so that there is a strong sample bias. There is a high prevalence of psychosis among the prisoner population as well as high levels of risk factors for psychosis, with entry to prison being an additional risk factor. Routine screening of such a population could yield useful information in terms of the at risk mental state profile and aetiological correlates.

Chapter 5: Methodolgy

This chapter will describe the samples, assessment tools and procedures used for the both the prison and the community studies.

5.1 Method (Prison)

Setting: The study took place in a London male prison holding approximately 750 prisoners aged 21 and over, who were either awaiting trial or serving short sentences. Nationally, there are 130, 000 new receptions per year to prisons. Local prisons have the highest turnover. Prisoners at the study site have a mean length of stay of three months (Health Profile of Brixton Prison, 2007). In terms of prison life, this means that even if there for just a few weeks, a prisoner will have a new cellmate often on a weekly basis. The prison serves some of the most deprived boroughs in the south part of the city, including areas with a high incidence of psychotic disorders (Kirkbride et al, 2008).

Procedure: The daily reception register was surveyed every day by MJ. Prisoners who met the inclusion criteria were approached and recruited if they were able to provide signed informed consent (see Appendix A for Information Sheet and Consent Form). Screening was carried out face to face. All participants who screened positive were asked to take part in a further semi-structured interview with a clinician to establish whether they met the diagnostic criteria for an ARMS. A total of 60 prisoners who screened negative were also randomly selected for the face to face interview. Since our resources did not allow for every participant who required a CAARMS to receive one, it was necessary for participants to be randomly selected for this further assessment. The aim was for the visiting registrar to carry out two CAARMS interviews per week. Random selection was carried out in the following way: MJ would give a list of prison numbers pertaining to prisoners who required a CAARMS to the two officers in

healthcare, Mr L and Mr S. Mr L would assign a number from 1 – 6 to each prisoner. Prisoners were assigned their dice number in a consecutive way so that if eight prisoners required further assessment, they were assigned a dice number in consecutive order of their screening identification number (e.g. ID 321 was assigned a 2, ID 322 was assigned a 3, ID 323 was assigned a 4). Mr S would then throw a die and the number shown would identify the corresponding prisoner who would be given an appointment in healthcare with the CAARMS assessors to undergo the CAARMS. If there were more than 6 prisoners, then two dice were used and the corresponding numbers allocated were 2-12. When the Screen Negatives were also required to undergo CAARMS they were included in this process with their names added to the list. This is sampling without replacement. A prisoner is selected via their allocated number and that number is then excluded from the pool of numbers which can be chosen. If on the subsequent throw the number should appear, the dice would have to be thrown again. When one die is thrown the probability of any of the six numbers appearing is equal, but when two dice are thrown the probability varies by the different combinations possible to generate that number (e.g. there is a 1 in 36 probability of throwing a 2, but a 1 in 6 probability of throwing as 7). The probability then changes again when a number is excluded from the pool. Nevertheless, the act of throwing a 2 or a 7 remains random, albeit with unequal probabilities[2].

Assessments were carried out by a registrar from the OASiS (TWB), myself and a registrar from the prison (HM). HM and I underwent administrative training with TWB, observing at least three CAARMS assessments and rating the CAARMS independently before discussion of the assessment. Assessments were also discussed at the OASIS referral team meeting.

[2] Checked with Departmental Statistician Morven Leese.

Sample: Prisoners newly received from the courts, aged 21-40 years, who lived in the catchment area of the South London And Maudsley NHS Trust: the Boroughs of Lambeth, Southwark, Croydon or Lewisham. Prisoners with a previous history of psychosis, who had been transferred from other prisons, or with an insufficient level of English to complete the screening questionnaire were excluded.

5.1.2 Materials for Prison (see Appendix B)

The materials used in the prison are shorter versions of those used in the community (see Section 5.2.1). They are derived from the same questionnaires and therefore have the same wording of questions but there are less questions which in the case of the childhood adverse events also means less follow up questions. Due to self harm and suicide being a salient issue in custody, at the time of screening prisoners were also asked questions about their current mood and previous self harm and suicide attempts. In this way, we could follow up on concerns of current risk to self. This information was not collected in the community sample.

Demographic Proforma: A series of brief questions on age, employment, birthplace of the participant and his parents; accommodation; and family psychiatric history.

Childhood Adverse Experiences: Eight yes/no items examining experiences before the age of 17 years of bullying; physical abuse; witnessing family violence; separation from parents; being in care; sexual abuse; illness, injury or assault; and racial discrimination. On endorsement of an item, the participant was asked between what ages the event occurred. The first item was taken from the Retrospective Bullying Questionnaire (RBQ; Schafer *et al*, 2004), the last from the Perceived Ethnic Discrimination Questionnaire (PEDQ; Brondolo et al, 2005) and the remainder from the Childhood Experiences of Care

and Abuse Questionnaire (CECA-Q; Bifulco *et al*, 2005). See community section materials for further information on these scales.

Alcohol Questionnaire: Question on quantity and frequency of alcohol use in the month prior to reception.

Substance Misuse Questionnaire: Questions taken from the Cannabis Experience Questionnaire (CEQ; Barkus, et al., 2006; see community section materials for more detail). Yes/No lifetime use questions on 10 substances, followed by questions on quantity and frequency of use in month prior to reception. Participants were also asked to rate whether they viewed their substance use as problematic. They were asked if in the last year they had i) felt their alcohol or drug use was out of control ii) felt worried or anxious at the thought of not being able to get drugs iii) felt worried about their alcohol or drug use iv) they wanted to stop v) how difficult it was to stop. Answers to the first four questions were never, sometimes, often or always and to the fifth question easy, fairly difficult, very difficult, almost impossible. These items were scored from 0 (never, easy) to 3 (always or almost impossible), and then added together, giving a possible range of 0 to 15.

Depression, Anxiety, Self Harm and Suicide Attempts: A self rating between 0 (not at all) and 10 (extremely) for depression and anxiety. A yes/no question each to deliberate self harm or lifetime suicide attempt, which on endorsement was explored further to ascertain date and method of most recent event.

Criminal Justice System Data Questionnaire: Data on legal status (awaiting trail, convicted or sentenced), index offence, and whether it was the participant's first time in prison.

Screening Tool: The Prodromal Questionnaire – Brief Version (PQ-B; Loewy et al., 2011): A 25 item questionnaire derived from the original Prodrome Questionnaire (Loewy et al., 2005; see Section 5.2.1). Each question elicits a yes/no answer. If the answer is 'yes', a follow up question asks how strongly the participant agrees that the experience causes concern or problems. The original PQ-B was tested on a sample of adolescents in conjunction with the Structured Interview for Prodromal Syndromes (SIPS, Miller et al., 2003). Based on their results, the authors made three recommendations for maximising either sensitivity or specificity or both (Table 3). The current study sought to maximise sensitivity and therefore used a cut off point of endorsement of five or more items (of items #1-24) regardless of level of distress. The questionnaire was modified slightly by the addition of eight follow up questions to clarify particular items.

Modification of the PQ-B: It was noted early on that following the original instructions for maximising both sensitivity and specificity provided excellent sensitivity in this population but low specificity as a number of items endorsed at screening were seldom supported by the CAARMS and appeared to reflect a misunderstanding of the screening questions. Subsequently, participants were asked to elaborate what they meant in regard to those items at the end of each screening. For example, in relation to items 5 and 14 'Have you felt that you are not in control of your own ideas or thoughts?' and 'Do you worry at times that something may be wrong with your mind?' participants described feeling anxious, impulsive, at times out of control in their life, lacking concentration, unable to understand why they could not manage their anger, or overcome a substance use problem despite the negative consequences. In response to

item 18 ('do you feel that parts of your body have changed in some way, or that parts of your body are working differently?') participants

Table 3: Recommendations from authors from original study with adolescent population

	Cut off point	**Sensitivity %**	**Specificity %**	**PPV[1] %**	**NPV_2 %**
			Maximising sensitivity		
Yes to 5 or more items of items #1-24	5/24	91	55	86	48
			Maximising sensitivity and specificity		
Agree or strongly agree to distress on at least 1 item	1/24	82	70	90	54
			Maximising specificity		
Yes to at least 7 items out of 25	7/25	26	85		

[1] Positive Predictive Validity

[2] Negative Predictive Validity

often described age related changes, weight loss, health issues, and substance misuse health problems. As a result, a follow up clarification question was devised and added to eight of the items. Appendix C shows the modified PQ-B with the added items in bold. Table 3 displays the sensitivity and specificity results for different cut off points using both the original and the modified PQ-B version in this population as well as distress caused by items.

Further Interview: Comprehensive Assessment of At Risk Mental State (CAARMS; Yung et al. 2005): A semi-structured interview schedule for use by mental health clinicians. It has eight subscales with each subscale being scored 0-6. The scale scores intensity (impact on behaviour and conviction) and frequency of symptoms, distress caused by symptoms and whether they occur in the context of

substance misuse. Due to the time restrictions in the prison, we limited the assessment to the use of the Positive Symptoms Scales (encompassing Unusual Thought Content, Non-Bizarre Ideas, Perceptual Abnormalities and Disorganised Speech), and to four of the sections within the General Psychopathology Scale (Mania, Depression, Anxiety and Self Harm and Suicidality).

Criteria for at risk mental state in both the community and the prison is based on the scoring of the Positive Symptoms Scales. The assessment uses the PACE ultra-high risk (UHR) criteria for an ARMS: individuals in the peak age group associated with first episode psychosis (14-35 in the community, 18-40 in the prison) should meet at least one of three other criteria in conjunction with a recent significant drop in functioning: i) first degree relative with psychosis or schizotypal personality disorder and/or ii) attenuated psychotic symptoms defined as a minimum score of three each on both intensity and frequency on any of the Positive Symptoms Scales and/or iii) a psychotic episode lasting 7 days or less that resolves itself spontaneously (Yung & McGorry, 1996a; Yung et al., 2005). Symptoms should occur at least sometimes outside of the context of substance use or withdrawal.

The Social and Occupational Functioning Assessment Scale (SOFAS; Goldman et al., 1992): rates social functioning from 0 (unable to function without support) to 100 (good functioning in all areas). Ratings are divided at 10 point intervals.

5.2 Method (Community)

Setting: Participants were recruited via the OASIS Service. All participants taken on by the service meet UHR criteria according to the CAARMS. The service is an early detection community mental health team that treats patients aged 14-35 years who are at high risk of developing psychosis with the aim of preventing or delaying the transition to psychosis, or improving outcome should transition occur. The

service serves two of the four SLaM boroughs, Southwark and Lambeth, which are captured by the prison study.

Sample and Procedure: Participants were first taken on by the OASIS caseload before being asked if they would participate in research. Access to OASIS is via self referral or referral from other agencies (GP, CMHT, family members, friends, educational establishments, voluntary services). All referrals were screened with a view to ensuring i) suitability for assessment and ii) that the person be help seeking and therefore be willing to engage with the team at the outset. Exclusion criteria were i) outside the OASIS age range ii) outside the OASIS catchment boroughs iii) history of psychosis iv) current psychosis. All suitable referrals underwent a CAARMS assessment with a psychiatrist or clinical psychologist to determine whether they met UHR criteria. Those that did were taken on the OASIS caseload and offered psychological therapy, support, education, monitoring, and as a last resort in a minority of cases medication. Following established engagement with the service, all clients were approached to participate in research. Clients were informed that participation in research was voluntary and did not affect their involvement with the service. Clients were given written information and were required to give informed consent before participating in research.

5.2.1 Materials for Community (See Appendix D)

Prodrome Questionnaire (PQ: Loewy et al., 2005): A 92 item self report questionnaire about prodromal symptoms with true/false answers. In addition to original items, the PQ has also adopted items from the Schizotypal Personality Questionnaire (Raine, 1991), and probe questions from the Structured Interview for Prodromal Syndromes (SIPS; Miller *et al,* 2003). The questionnaire covers four major subscales: Positive, Negative, Disorganised and General Symptoms. The PQ does not assess distress.

Comprehensive Assessment of At Risk Mental State (CAARMS; Phillips et al., 2000): A semi-structured interview schedule for use by mental health clinicians. It has seven subscales with each subscale being scored 0-6. The scale scores intensity (impact on behaviour and conviction) and frequency of symptoms, distress caused by symptoms and whether they occur in the context of substance misuse. The Positive Symptoms Scales comprised Disorders of Thought Content, Perceptual Abnormalities and Disorganised Speech. This version differed from the later version used in the prison study in that two of the subscales in this version were merged (unusual thought content and non bizarre ideas). However, the items were exactly the same as was the scoring criteria (frequency of the most severe)[3]. Criteria for ultra high risk mental state is the same as for the prison study: i) first degree relative with psychosis or schizotypal personality disorder and/or ii) attenuated psychotic symptoms defined as a minimum score of three each on both intensity and frequency on any of the Positive Symptoms Scales and/or iii) a psychotic episode lasting 7 days or less that resolves itself spontaneously, combined with a significant drop in functioning (Yung & McGorry, 1996a).

The community service draws from an age pool of 14-35 years and obviously includes females. For the purposes of this study, a subsample of adult male participants were selected for comparison.

Retrospective Bullying Questionnaire (RBQ; Schafer *et al*, 2004): A self report questionnaire comprising 44 questions examining experiences and appraisals about bullying during childhood and teenage years. The questionnaire seeks information on frequency, intensity and duration of the bullying as well as information on the aggressors (gender and number of aggressors).

[3] items were later broken down into two scales with a view to understanding symptoms better and facilitate scoring.

Childhood Experiences of Care and Abuse Questionnaire (CECA-Q; Bifulco *et al*, 2005). A self report questionnaire based on a validated interview tool (CECA; Bifulco *et al*, 1994) assessing adverse experiences before the age of 17 years. Items on parental loss, parental care (antipathy and neglect), physical and sexual abuse are rated on a Likert Scale (1= 'yes definitely' to 5 = 'not at all'). Cut off data is then used to dichotomise the adversity as present or absent, creating a total adversity score.

Perceived Ethnic Discrimination Questionnaire (PEDQ) - Community version (Brondolo et al, 2005). The PEDQ comprises four subscales assessing experiences of social exclusion, stigmatisation, discrimination at work/school, and threat/harassment items. Items are also assessed for frequency.

Substance Misuse: A modified version of the Cannabis Experience Questionnaire (CEQ; Barkus, et al., 2006). Yes/No lifetime use questions on 9 substances (type of cannabis was not distinguished between marijuana or skunk). On endorsement of lifetime use, information was also sought on age of first use, most recent use, followed by questions on quantity and frequency of use in month prior to interview. Participants were also asked to rate whether they viewed their substance use as problematic. They were asked if in the last year they had i) felt their alcohol or drug use was out of control ii) felt worried or anxious at the thought of not being able to get drugs iii) felt worried about their alcohol or drug use iv) they wanted to stop v) how difficult it was to stop. Answers to the first four questions were never, sometimes, often or always and to the fifth question easy, fairly difficult, very difficult, almost impossible. These items were scored from 0 (never, easy) to 3 (always or almost impossible), and then added together, giving a possible range of 0 to 15.

5.3 Analyses

SPSS Version 17.0 was used to analyse the data. T-tests were used to compare continuous variables and chi-squared to categorical variables. The CAARMS data did not meet the assumption of homogeneity of variance with there being wide variation between the groups. These scores were therefore treated as ordinal data and were analysed using the Mann-Whitney test. Items which were found to be significant at univariate analysis level were then entered into a logistic regression to identify independent predictors of the outcome. The issue of weighting the data was considered due to the difference in sample sizes between the groups, but discarded on the grounds that weighting is appropriate to correct for selection bias which might lead to outcomes that are unrepresentative of the population sampled.

No power calculation was carried out for the project since it was an exploratory study which was the first of its kind and therefore there was no data upon which to estimate effect or sample size. While prospective power analyses aim to examine the association between speculated sample sizes, effect sizes, variance and statistical power (Thomas, 1977), retrospective power analyses involve the use of obtained data to interpret the relationship between sample size, effect size and statistical power (Hoenig and Heisey, 2001). Retrospective power calculations are not viable since they are calculated based on existing data as opposed to predicted data therefore changing the probabilities often giving an inflated post hoc probability (Zumbo and Bruno, 1988). However, effect sizes can be looked at retrospectively and for Chapter 9, the comparison between the community and the prison group, a post hoc effect size calculation was carried out for the primary outcomes. Phi was used as the effect size statistic for chi-squared 2x2 tables, Cramer's V for chi-squared multiple tables and Pearson's correlation coefficient, r, for association between means. Cohen's (1992) recommendation of 0.1 for small effect size (signifigying

that the effect accounts for 1% of variance), 0.3 for medium (accounting for 9% of variance), and 0.5 for large effect size (accounting for 25% of variance)[4].

[4] Checked with Departmental Statistician Paul Williams.

Chapter 6: A comparison of prisoners who screened positive and those who screened negative on the PQ-B

This chapter is a comparison of prisoners who were positive at screen compared to those who were negative followed by a discussion the findings.

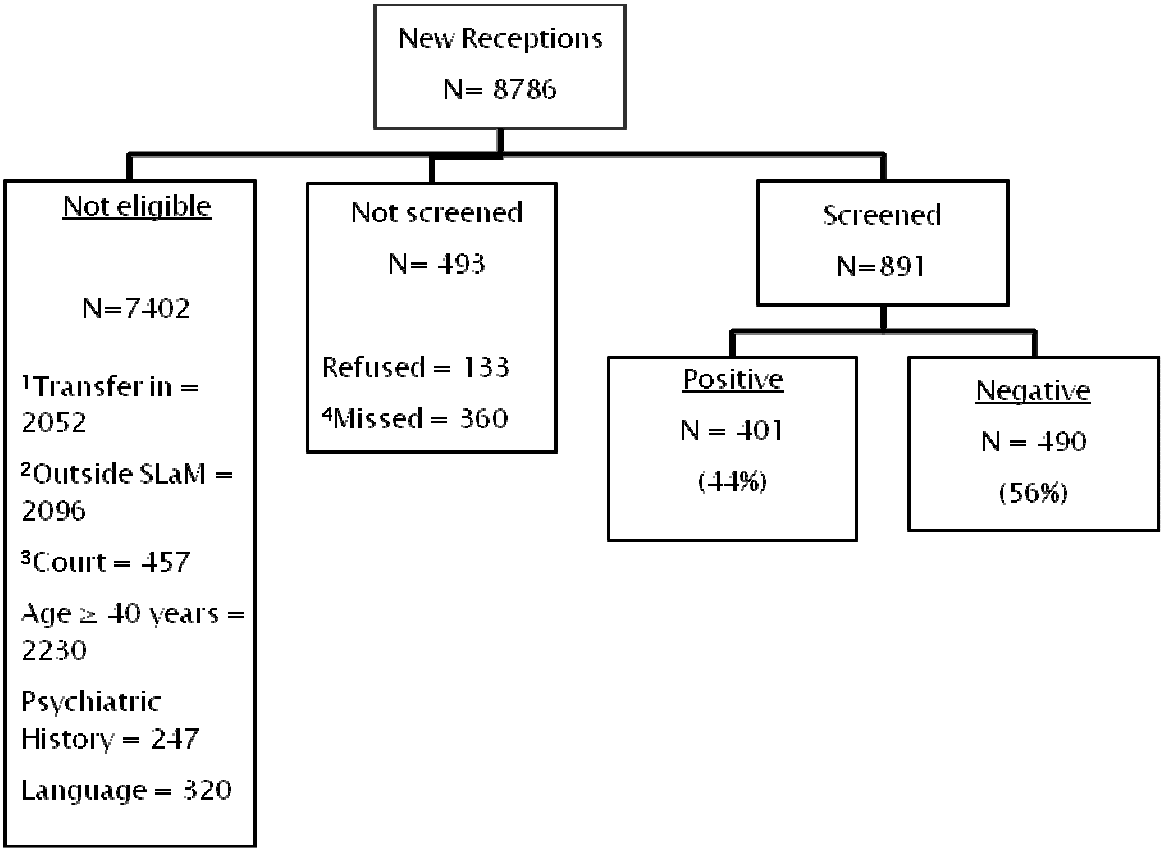
6.1 Hypothesis:

Prison participants who screened positive for ARMS would have correlates of social exclusion, in particular homelessness; childhood trauma, substance misuse, and be more likely to be of Black and Ethnic Minority than those who screen negative. They will also be more likely to have family history of mental health problems, have higher self ratings for anxiety and depression, and be more likely to have a history of self harm and attempted suicide.

6.2 Sample

Figure 1 is a flow chart summarising study participation from initial screening to assessment outcome. Total number of receptions refers to the reception lists obtained throughout the study. Lists were not obtained on days when MJ was not in the prison (e.g. when on leave or on training days). In the 'Not Eligible' category, were those who did not meet inclusion criteria (transfers from another prison, age >40 yrs, residence outside of the study catchment area, prisoners whose level of English was not sufficient for the study, those with previous or current psychosis diagnosis). Also not eligible were those who were attending court on a daily basis for trial and were therefore not in the prison during the day. Some prisoners were not screened due to being transferred to other prisons or being released before they could complete the

Figure 1: Consort chart 16/02/09-13/12/11



1. Prisoners who had transferred in from other prisons rather than being received from court.
2. From outside four boroughs of SLaM, and therefore from outside the study's catchment area.
3. Attending court for trial and therefore not available to participate in the study.
4. Participating in concurrent prison activities and therefore unavailable for interview.

clinical assessment. Others were participating in other concurrent prison activities that prevented them from being interviewed. The minority of prisoners who declined to be screened said they did so because they thought they did not have a mental health problem. Not all of those in the 'Not Screened' category would have met all the inclusion criteria.

Due to the issues around high levels of psychosis among non White groups in the community, we collected information on the proportion of Black, White and Other prisoners who refused to participate in the study to compare against proportions of these groups in the prison in order to establish whether there were any sampling biases. Table 4 shows the proportions of broad ethnic groups in relation to participants in the study and those who refused to participate. Ethnicity of those who did participate is reflective of the prison population.

Table 4: Ethnicity of participants in the study, those who refused and all of HMP Brixton.

	This study			
	Participants (N=891)	Refused (N=133)	Total (n=1024)	HMP Brixton[1] (N=751)
Black	49 (439)	60 (80)	51 (519)	48%
White	35 (312)	30 (39)	34 (351)	34%
Other	16 (140)	6 (8)	14 (148)	9%
Unknown	0	4 (6)	0.6 (6)	10%

[1] Data at time of 4th January 2012 (Personal communication HMP Brixton Equality and Diversity Department).

Of the 891 prisoners screened, 401 (44%) screened positive, seven (0.8%) of whom were found to be psychotic. The seven prisoners who were psychotic had all scored positive on the PQ-B but in addition were help seeking and volunteered further information at screen. For the purposes of analyses at this stage they are grouped within the screen positives sample.

6.3 Screen positives versus negatives

This section of the results focuses on comparing the participants who screened positive compared to those who screened negative. A screen positive indicated that they required further assessment to see if they met criteria for ARMS.

Table 5 shows the demographic characteristics of participants who screened positive compared to those who screened negative. The variable of age did not meet the assumption of normal distribution, being leptokurtic indicating a skew towards the lower end of the age group (kurtosis 5.07, skewness 5.35). As a result comparisons between groups were made using the Mann Whitney test. There were no significant differences in age. However, prisoners who screened positive were more likely to be UK born. There was a trend towards higher prevalence of White British Ethnicity among the screen positive group. This result was in the opposite direction of our hypothesis. Just one quarter of prisoners who screened positive were first receptions (in prison for the first time). The remainder had previous experience of custody. In contrast, the screen negative group had a significantly higher number of first receptions (40%).

Table 5: Characteristics of sample

	Screen positive (N=401)	Screen negative (N=490)		P
Age (median)	28	28	u=97065.50, z=-.297, r=0.009	.76
Ethnicity % (N)				
Black	46 (183)	53 (259)		
White	39 (156)	32 (157)	χ^2 (2) = 5.29	.07
Other	16 (62)	15(74)		
UK Born % (n)	73 (292)	67 (329)	χ^2 (1) = 3.75	0.05
Non UK Born % (n)	27 (108)	33 (162)		
First time in prison % (n)	25 (97)	40 (189)	χ^2 (1) = 22.5	.000
Remand	59 (236)	58 (284)	χ^2 (1) = .122	.73

A comparison between the groups was carried out to examine whether those who screened positive were more likely to have been socially excluded before coming to prison.

Table 6 shows the results. The age at which prisoners had left full time education did not meet assumption of normal distribution having a kurtosis of 5.214 and a standard error of 0.164. The peak occurred as expected at the age of 16 years. The median age of school leaving for both groups was 16 years, but there was a difference in mean age at which education ended of a year, with prisoners who screened positive being more likely to have stayed on studying for an extra year at the age of 16. Despite this there were no differences between groups as to whether or not they had qualifications. The screen positive group were significantly less likely to have been employed or in education prior to prison. They were also less likely to have long term accommodation prior to reception, and significantly more likely to have been homeless prior to reception to prison.

Table 6: Social Exclusion

	Screen positive (N=401)	**Screen negative (N=490)**		**Sig**
Age left full time education mean (sd)	16.2 (3.0)	17.4 (5.5)	T(889df) =3.9	.000
	% (N)	% (N)	χ^2 (1)	
No qualifications	36 (145)	32 (159)	1.47	.226
Not working or studying	64 (256)	52 (255)	13.2	.000
Temporary Accommodation	42 (169)	28 (139)	18.94	.000
Homeless	13 (50)	3 (15)	29.07	.000

Table 7 shows the differences in childhood adverse life events between the groups. All eight items are significantly more likely to have been experienced by individuals who screened positive compared to those who screened negative.

Table 7: Childhood adverse life events (up to age 17 years)

	Screen positive (N=401) % (n)	**Screen negative (N=490) % (n)**	**χ^2 (1)**	**Sig**
Bullying	48 (192)	19 (92)	88.0	.000
Physical Abuse	62 (246)	30 (145)	92.5	.000
Witness violence	60 (238)	28 (139)	88.8	.000
Separation	56 (233)	36 (177)	44.7	.000
In care	36 (143)	21 (101)	26.0	.000
Sexual abuse	15 (61)	5 (24)	27.8	.000
Injury as child	52 (208)	33 (163)	32.8	.000
Discrimination	35 (141)	19 (92)	31.6	.000

Table 8 shows the drug and alcohol use in the month prior to reception. Although the PQ-B asks for endorsement of questions only if the person has experienced the symptoms in the previous month while drug free, this constraint had to be relaxed for the present study. For all items, individuals who screened

positive had significantly higher drug use than those who screened negative. We used the maximum weekly allowance for alcohol as recommended by the NHS of >3-4 units per day as a cut off point for alcohol use (www.nhs.uk/conditions/alcohol-misuse).

Table 8: Substance misuse in last month

	Screen positive (N=401) % (n)	**Screen negative (N=490) % (n)**	**χ^2 (1)**	**Sig**
>21 units alcohol/week	35 (140)	11 (53)	76.1	.000
Commercial weed	53 (211)	31 (152)	43.4	.000
Skunk	56 (225)	38 (186)	30.0	.000
Inhalants	0.7 (3)	0.2 (1)	1.45	.23
Crack	26 (102)	10 (47)	40.2	.000
Cocaine	19 (74)	11 (53)	11.0	.001
Stimulants	6 (24)	3 (13)	6.3	.012
Sedatives	23 (93)	6 (29)	56.1	.000
Heroin	22 (87)	7 (36)	38.4	.000
Hallucinogens	0.7 (3)	0.2 (1)	1.45	.23
Use >2	64 (258)	177 (36)	70.3	.000

Results for mental health items are shown in Table 9. An outcome of being screen positive was strongly associated with having a first degree family psychiatric history, although this was not necessarily a history of psychosis. Those who screened positive scored significantly higher when asked to score themselves on a scale of 0-10 for how anxious or depressed they had felt in the last month. Previous self harm and suicide were also much more prevalent in the screen positive group.

Table 9: Mental Health

	Screen positive (N=401)	Screen negative (N=490)	χ^2 or T	Sig
First degree family psychiatric history	26 (102)	7 (35)	χ^2 (1) = 51.2	.000
First degree family history psychosis	11 (40)	2 (11)	χ^2 (1) = 26.8	.000
Self rated depression (mean, sd)	6.9 (3.0)	3.2 (3.0)	t (887) = -16.77	.000
Self rated anxiety (mean, sd)	6.8 (2.9)	3.4 (3.4)	t (873) = -17.91	.000
Previous self harm % (n)	21 (85)	3 (14)	χ^2 (1) = 75.5	.000
Previous suicide attempt % (n)	31 (125)	5 (23)	χ^2 (1) = 112.3	.000
No of PQ items endorsed mean (sd)	13.7 (6.6)	1.6 (1.7)	t (443) -35.5	.000
No of PQ items causing distress mean	8 (5.7)	.55 (1)	t (419) 25.7	.000

6.4 Logistic Regression

The final part of the analysis was a logistic regression with screen positive or negative as outcome. Those items that were non significant in the univariate analyses above were excluded. The remainder were entered in 5 blocks using the forced entry method: items from Table 5 (excluding age); items from Table 6 (excluding qualifications); all items from Table 7, Table 8, and items from Table 9 (except for PQ items) in separate blocks. Logistic Regression was carried out over two stages with variables that did not meet significance level ($p > .05$) being excluded after the first stage. Table 10 shows the results for the second and final stage where all variables are significant at the $p < .05$ level. The largest odds ratio associated with screening positive was homelessness, with individuals who had been homeless being four times more likely to screen positive than those who had screened negative. Five items relating to childhood adverse life events were also predictive of positive screen: bullying, physical abuse, having witnessed family violence, having had a serious illness or injury as a child, and having experienced discrimination. Use of alcohol and all drugs in the last month except inhalants and hallucinogens were entered into the model, but only alcohol proved to be a significant predictor. Individuals who were consuming more than 21 units of alcohol per week prior to reception were over three times more likely to screen positive compared to their screen negative counterparts. Lastly, all items relating to mental health with the

exception of previous self harm were also more likely to predict a positive screen. Ratings for depression and anxiety are continuous variables with participants rating themselves from 0-10, with higher ratings indicating worse mood.

Table 10: Results from Logistic Regression

Item	B (S.E.)	Exp (B) (CI 95%)	P
Homeless	1.45 (.43)	4.08 (1.835 – 9.959)	.001
Bullied	.52 (.21)	1.67 (1.029 – 2.255)	.01
Physical abuse	.78 (.19)	2.21 (1.519 – 3.221)	.000
Witnessing family violence	.56 (19)	1.75 (1.145 – 2.445)	.004
Injury illness	.59 (.18)	1.81 (1.251 – 2.608)	.002
Discrimination	.52 (21)	1.68 (1.130 – 2.556)	.01
>21 units per week	1.23 (.24)	3.52 (2.204 – 5.589)	.000
Family history psychosis	1.03 (.49)	2.81 (1.377 – 4.036)	.04
Anxious	.16 (.03)	1.17 (1.099 -1.244)	.000
Depressed	.20 (.03)	1.23 (1.148 -1.305)	.000
Attempted suicide	1.33 (.31)	3.77 (1.827 -6.080)	.000
constant	-3.78 (.26)	0.22	.000

These results were not subject to multicollinearity effects (tolerance values ranged from .83 - .96, and VIF values ranged from 1.04 to 1.22).

6.5 Discussion

The aim of this project was to establish prevalence and correlates of ARMS among a prisoner population. In order to do that, we first screened prisoners using a questionnaire for prodromal symptoms before assessing them further. This section represents the results of that first stage of screening. We screened 891 newly arrived prisoners, and 44% (N=401) screened positive indicating a further assessment was

required to see if they met criteria for ARMS. Of these, seven were identified as psychotic and were referred to the Outreach Team. A screen positive in itself did not indicate the presence or absence of any mental health problem. We hypothesised that in comparison to prisoners who screened negative, prisoners who screened positive would have higher rates of: social exclusion, in particular homelessness; childhood adverse life events; higher rates of drug use; higher scores of self rated anxiety and depression; higher rates of family psychiatric history; and higher rates of previous self harm and suicide.

Almost all variables were individually strongly associated with a screen positive outcome. However, there were no differences between the groups in age, level of qualifications or legal status (whether awaiting trial or sentenced). The first two of these variables were excluded from the logistic regression model but the last was included despite being non significant due to the higher prevalence of mental disorder among remand populations (Singleton et al., 1998). In total 30 variables were entered into the model, and 11 were independently associated with a screen positive outcome:

- having been homeless prior to coming to prison
- five childhood adverse life experiences -having been bullied; having experienced physical abuse; having witnessed violence in the home; having had a serious injury or illness; having experienced racial discrimination
- use of high levels of alcohol prior to reception
- a first degree family psychiatric history
- higher self ratings for anxiety and depression compared to the screen negative group
- previous suicide attempt

The picture is one of individuals with disrupted family and social networks. They have grown up in hostile environments and found little relief from this outside the home. A significant finding for

homelessness suggests that this lack of support has extended into adulthood. The finding of previous suicide attempt fits with high levels of anxiety and depression.

Variables which were not predictive of outcome may be due to the fact that they form part of the general prisoner profile. The overall ethnicity of the total sample was similar to that in the prison study site, as were the proportion of individuals on remand or sentenced. Approximately 52% of male prisoners have no qualifications (Williams, 2012a); between half and 70% of prisoners are unemployed at the time of entering prison (Social Exclusion Unit, 2002; Stewart, 2008), and around 32% do not have long term accommodation at the time of coming to prison (Social Exclusion Unit, 2002). Similarly, under the childhood adverse life events, almost a third of the total sample had been in care as a child and this is in line with previous literature (Williams et al, 2012a). Participants were screened as soon as possible after reception but up to a maximum of one week. The screening questionnaire is aimed at eliciting symptoms outside of the context of drug use and at times this was not possible. We were therefore surprised that recent use of class A drugs or even cannabis was not predictive of a screen positive outcome. However, many prisoners reported using one drug to ameliorate the effects of another e.g. the so called 'snowball', when individuals take heroin after having taken crack to soften the withdrawal symptoms of crack (Mistral et al., 2008).

6.6 Strengths and Limitations

As far as we are aware this is the first study to use a prodrome screening tool in a prison population and as such is original in its aim to examine the use of this type of questionnaire in a population known to have high rates of mental health problems, in particular, high prevalence of psychosis. The substantial sample size was useful on which to draw conclusions from the results. The sample was ethnically representative of the prison in which the study was carried out. Of the 493 prisoners who were not

screened, 133 refused, mostly reporting that they did not need a mental health assessment. A further 360 were missed completely as they were participating in concurrent prison activities. It was possible to identify from the prison database that these individuals were new receptions and aged 35 or under. However, there was no way of identifying whether they had experienced a psychotic episode in the past or whether they were from the relevant geographical area. The ability to negotiate the prison system in the first few days to achieve attendance at education, gym or work is indicative of knowledge of prison and in particular this prison, but also shows a high level of motivation and therefore functioning. It may be that we have a slight bias in the sample of having drawn from a pool of individuals who are less able to navigate the bureaucratic obstacles in the early days of custody. However, only those who met full criteria of eligibility would have influenced the results so the impact was limited.

Since it was the first study of its kind, we did not have a basis on which to predict how many participants would screen positive. This is an important issue, since screening questionnaires merely generate cases which then require further assessment so the specificity and sensitivity of the questionnaire is crucial, especially in such a time pressured environment (Grubin, 2010). The PQ-B's effectiveness will be analysed and discussed in Chapter 7. At this stage it is important to recognise that a screen positive does not tell us who has an ARMS, it simply indicates further assessment is required. The findings from this section need to be examined in the context of the findings from the subsequent stages at which those who have screened positive have undergone a further assessment to establish whether they have an ARMS.

Chapter 7: Identifying men at ultra high risk of psychosis in a prison population

This chapter is an examination of the sensitivity and specificity of the screening questionnaire.

7.1 Sample

The original PQ-B was used with an adolescent population (Loewy et al., 2011). These results provide an update on a publication which addressed the use of the PQ-B in the prison population (see Jarrett et al., 2012; Appendix E). That analysis was based on information drawn from 750 participants. This chapter is based on data drawn from the total sample of 891 participants (see Figure 3 in Chapter 8). Of the 401 participants who screened positive, seven were found to be psychotic at screen and were therefore referred to prison mental health services. They endorsed symptoms at screen and communicated high levels of distress about their mental state leading to further exploratory questions which revealed the probability of psychosis. These seven consequently did not undergo the comprehensive assessment for ARMS. A further 82 participants were not assessed due to being released suddenly (N=56), transferred to other prisons (N=11) and refusing to participate (N=15). In addition, due to limited resources, some participants who screened positive were not assessed (N=18), bringing the total number of partipants who screened positive but did not undergo the CAARMS to 107. The remaining 294 (73%) participants underwent the second stage interview. In addition, 60 of the 490 (12%) participants who screened negative also underwent the second stage assessment in order to provide a set of controls. Clinicians carrying out the CAARMS at this stage were blind to screen results of the participants they were assessing. Of the screen negative participants, just one was found to be positive for ARMS.

Of the 294 people who had screened positive and then underwent the CAARMS, 43 (15%) were found to have an ARMS. A further 18 (6% of CAARMS) were found to be psychotic and were referred to mental

health services (the total of this group was 25 after including the seven participants who were found to be psychotic at screening). The remaining 233 (79%) were found to be negative for ARMS. Based on the total number of screens (N=891), we found a prevalence of 3% (N=25) for psychosis and 5% (N=44) for ARMS (including the participant who had screened negative).

7.2 Results

Participants who met criteria for ARMS or psychosis were compared to those who did not meet criteria for either condition on age, ethnicity, whether they had any qualifications, had been in care as a child, were awaiting trial (as opposed to being sentenced), and whether it was their first time in prison. The age variable did not meet parametric assumptions due to being skewed to the left and having a peak at the lower age ranges (skewness 3.23, kurtosis -.3.30). The Mann-Whitney test was therefore used to compare the groups. Those variables which were not already dichotomous were categorised accordingly for the purpose of chi-squared analyses for the remainder of the variables. Receiver Operating Curves (ROCs) were used to measure sensitivity versus specificity.

7.3 Characteristics of participants

Table 11 shows the demographic characteristics of participants with an ARMS, and those who were psychotic, compared to the group with neither, and the wider prison population. Some data were obtained that were specific to the prison in the study, but where this was not possible data from the general male UK prison population was used as reference. There were two significant differences between the groups. The first was that the ARMS group were significantly more likely to have no qualifications in comparison with the group who did not have an ARMS. The psychotic group were more likely to be on remand rather than sentenced compared to the other two groups.

Table 11: Participant characteristics comparing UHR and Psychotic groups to Neither

	ARMS N=44	Psychotic N=25	Neither N=292	ARMS vs Psychotic	ARMS vs Neither	Prison Population
		Median		**P**		
Age	26	26	28	.94	.16	70% aged<40 years
		% (N)	**% (N)**			
White	36 (16)	20 (5)	36 (105)	.16	.96	30.3%
No qualifications	50 (22)	36 (9)	32 (91)	.26	**.01**	52%
In care as child	34 (15)	32 (8)	33 (97)	.86	.93	27%
Awaiting Trial	46 (20)	84 (21)	59 (173)	.002	.10	33% (Study Site)*
First time in prison	21 (9)	20 (5)	24 (69)	.96	.63	22% (Study Site)*

*(Health Profile of prisoners in Brixton Prison, July 2007)

7.4 Sensitivity and specificity

The overall results show that the PQ-B (both original and modified) has good sensitivity but low specificity (Table 12). Almost all of those who presented as negative at screening were subsequently assessed as true negatives, whereas many of those who presented as positive at screen were assessed to be false positives. Arguably the most useful cut off point for this population is endorsement of four items out of the total of 33 which also cause distress (rated agree or strongly agree). This yields a 93% sensitivity, 36% specificity, 18% Positive Predictive Value, and 97% Negative Predictive Value.

In practice this involves missing less than one true case in ten, and eliminating approximately a third of interviews of non cases. The specificity can be improved upon by using endorsement of five additional items or distress on items 1-25, but to do so would involve losing sensitivity and missing at least 1 person in ten that was true positive. The high level of mental health problems in this population mean that a

questionnaire that identifies a broader range of mental health problems could be more useful than having a highly specific tool that identifies just one low prevalence condition.

Table 12: Sensitivity, Specificity, Positive and Negative Predictive Values[1,2]

	Cut off point	sensitivity	specificity	PPV[1]	NPV[2]
Maximising sensitivity (%)					
Items endorsed / total number of items	5/24	98	20	16	98
	5/25	98	20	16	98
	5/33	98	18	15	98
	6/33	95	24	16	97
Maximising sensitivity and specificity					
Items causing distress / total number of items	1/24	95	18	15	96
	2/25	95	28	16	98
	3/25	95	34	18	98
	4/25	87	41	19	96
	5/25	86	49	20	96
Maximising specificity					
Distress/ total items	7/25	77	60	23	95
Distress in combination with follow up items					
Distress total plus extras	5/33	89	42	19	96
Distress total plus extras	4/33	93	36	18	97

Receiver operating curves (ROCs) show the trade off between sensitivity and specificity against the different possible cut off points of the test. Figure 2 shows the ROC analyses using i) endorsement of items 1-25 ii) distress on items 1-25 and iii) using a combination of distress on items 1-25 as well as endorsement of the additional items. The Y axis gives the number of true positives (sensitivity) and the X axis, the number of false positives (1-specificity). The curve always begins in the lower left hand corner (0,0) signifying no positives, and reaches across to the upper right hand corner (1,1) signifying all positives. A receiver operating curve which indicates chance results will lie near the diagonal line between 0,0 and 1,1 co-ordinates (the reference line). If the screening instrument functions worse than chance, the curve will fall below the diagonal line. A screening instrument that functions better than

chance will show a curve above the diagonal line. The closer the curve follows the top and left hand corner of the space, the more accurate the test. A screening instrument which classifies outcome perfectly will yield a point in the upper left hand corner (0,1) indicating 100% sensitivity and 0% false positive rate (or 100% specificity). The Area under the Curve (AUC) value is the probability that the screening instrument classifies individuals correctly compared to a random classification.

Figure 2: Receiver Operating Curve PQ-B

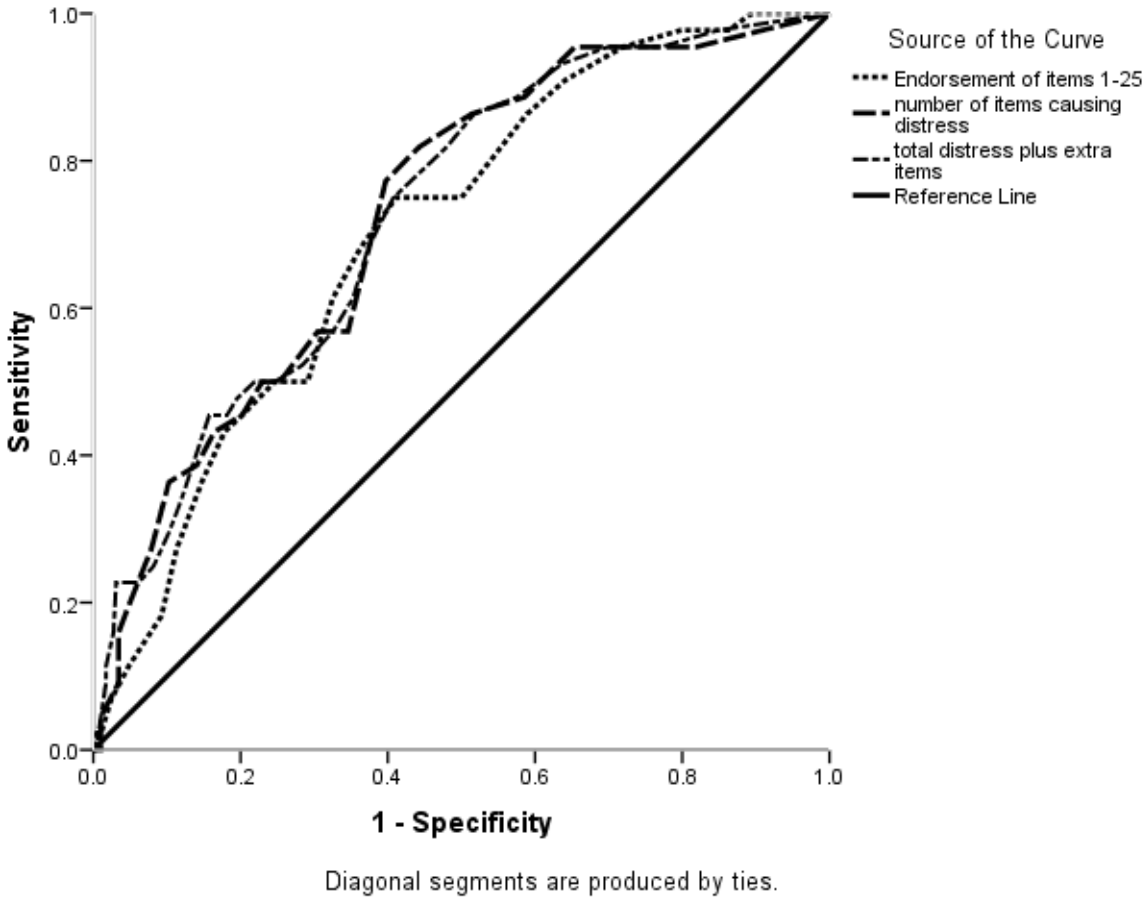


Table 13: Area under the Curve

Area Under the Curve

Test Result Variable(s)	Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
Endorsement of items 1-25	.703	.038	.000	.628	.778
number of items causing distress	.726	.038	.000	.651	.801
total distress plus extra items	.726	.038	.000	.651	.801

b. Null hypothesis: true area = 0.5

A random classifier has an Area under the Curve of .50 (that of the reference line), with perfect prediction being 1. Each point on the curve represents co-ordinates of sensitivity and specificity at a particular cut off point. The AUC was significant for all three ROCs, with distress on items yielding an AUC of at least .73 (Table 13). The PQ-B appears to identify all those with ultra high risk state and psychosis, but also identifies individuals who have other mental health issues. For this reason it was felt that it would be important to have a questionnaire with a high level of sensitivity, at least 90% and therefore risk a lower level of specificity.

7.5 Discussion

The aim of this paper was to evaluate the utility of the PQ-B when used in a prison population. Of the 891 prisoners screened, we found 3% (N=25) to be psychotic and 5% (N=44) to have an ARMS. In addition, we became aware over the course of the study that three of the participants who were found to have an ARMS made transition while in prison (at 2, 3 and 6 months following CAARMS assessment).

We found that the unmodified questionnaire had a very high sensitivity but low specificity. We identified four probable causes for the low specificity: misinterpretation of items; high anxiety on reception to prison; drug and alcohol related issues; and other mental health issues. We will discuss each of these in turn.

Misinterpretation of items: We modified the initial PQ-B because of the high level of misinterpretation of items among the prisoners we initially screened. This may partly reflect the relatively low level of educational attainment among prisoners: approximately 80% have a reading age of less than 11 years of age (Social Exclusion Unit, 2002). So for example, some participants confused the idea of someone interfering with their thoughts with being influenced by others (items 5 and 5a). For questions relating to paranoia, participants described hypervigilance which they thought necessary to their safety. One participant explained how one brother had been shot dead recently and the same perpetrators had gone to his house and threatened to shoot another member of his family in the mistaken belief that this person was the participant. He endorsed all paranoia items in the screen with distress. Other items (believing in ghosts or mind reading, or things that other people find unusual) tap into beliefs related to the paranormal or conspiracy theories which are common in many cultures and even more prevalent in people of a non-White British cultural background (Dein, 2012). This issue highlights the importance of validating questionnaires in different populations.

High anxiety on reception: Participants were screened within the first week of reception to prison. Previous research has shown that the first week of imprisonment is associated with high levels of distress in newly received prisoners. A prospective cohort study examining changes in mental well being of prisoners from first week to one and then two months in custody found that that 25% of prisoners with no mental illness met the General Health Questionnaire prison level of caseness (Hassan et al., 2011) in

their first week in prison. The scale measures the inability to carry out normal functions and the appearance of new and distressing phenomena (Goldberg, 1978). Much suicide prevention work in prison focuses on early screening since a third of prison suicides occur within the first week, and most of those occur within the first three days (Shaw et al., 2004). The PQ-B has various items that can be interpreted as anxiety type symptoms (e.g. feeling that the environment is strange, confusing or threatening, feeling that you are not in control of your thoughts, feeling distracted by distant sounds). In the present study, while screening participants when they may have been at their most anxious may have increased the number of screen positives, it also increased the likelihood of us detecting prisoners with an ARMS, through greater expression of their symptoms.

Drug and alcohol issues: A local prison such as the one in this study can see up to ten new receptions that are drug dependent per day (Prison Drug Treatment Strategy Review Group, 2010). Of the prisoners in this study who were regular drug users, most had used substances in the month prior to their arrival in prison. Instructions on the PQ-B recommended that questions should be endorsed if present in the last month and outside of the context of drug use. At times this was not possible in this population, in whom the priority was to screen in the first few days of reception. Instead we allowed a delay of a few days before carrying out the CAARMS to permit substance misuse related symptoms to subside. Participants who experienced symptoms only when under the influence of substances or substance withdrawal often reported this as the case. Symptoms were only rated as positive for ARMS if they occurred at least sometimes in the absence of a substance misuse context.

Other mental health issues: Many of the prisoners who screened positive but did not have an ARMS did have other mental health problems, such as major depression, severe anxiety, and personality disorder were identified. For example, three of the items in the PQ-B are aimed at detecting paranoid thoughts.

Previous research has indicated that 29% of the male prison population meet criteria for Paranoid Personality Disorder (Singleton et al., 1998). Due to time limits on the assessments we did not formally assess for personality disorder at the second stage of interview. There were also individuals displaying high levels of distress with associated markers of other personality disorders such as Borderline Personality Disorder. Where such disorders were identified in the course of the study, procedures were taken to reduce the risk of self harm and suicide and referrals made to other services.

The above sections are not mutually exclusive. The participant who related high levels of hypervigilance due to recent threats was also experiencing high levels of anxiety. Some of the items in the PQ-B (e.g. feeling not in control of thoughts, being more withdrawn, feeling as though you don't exist) are associated with symptoms of other mental health issues such as anxiety, depression, and post traumatic stress disorder.

7.6 Strengths and Limitations

This was the first study to implement screening for At Risk mental States for Psychosis in a prison population. Importantly, prisoners have high rates of mental health problems and in particular high rates of psychosis and the ARMS. 3% of participants in the study were identified as being in their first episode of psychosis, most of whom would have otherwise gone undetected and untreated. The study played a role in signposting participants with other mental and physical health problems to the appropriate services. In addition we contributed to a safer custody environment by helping to identify prisoners who were at risk of suicide or self harm. This study was also original in that it did not target a help seeking population but rather approached everyone that met the inclusion criteria. Although the population were not seeking help they were often happy to receive it when offered.

We have demonstrated the PQ-B screening questionnaire is very sensitive at detecting those would like help with a mental health problem. This includes those who meet criteria for an ARMS, but also encompasses those who are in high levels of distress for due to other mental health issues. It correctly screens out those who do not have ARMS or other mental health problems. Previous research has shown that a significant amount of psychiatric morbidity goes undetected by reception screening in prison (Birmingham et al., 1997). It is therefore not necessarily a limitation that a further specific mental health screening should detect a broad category of mental health problems. The study was limited by the fact that almost no participants could be followed up.

This study found a substantial number of prisoners with an ARMS. Individuals with and ARMS in the community have a very high risk (30-35%) of developing psychosis within two to three years (Fusar-Poli et al., 2012b; Woods et al., 2009). Taking into account that coming to prison can be viewed as an extra stressor, the risk for individuals who have an ARMS making transition in this environment may be greater than in the community. This highlights the importance of effective psychiatric screening on arrival and also the need for a broader range of psychiatric services in prisons, in particular those aimed at early detection and intervention of psychosis.

Chapter 8: A comparison of prisoners who met criteria for ARMS with those who did not meet criteria

This chapter details a comparison of prisoners who met criteria for ARMS at the second stage assessment with those who did not, followed by a discussion of the findings.

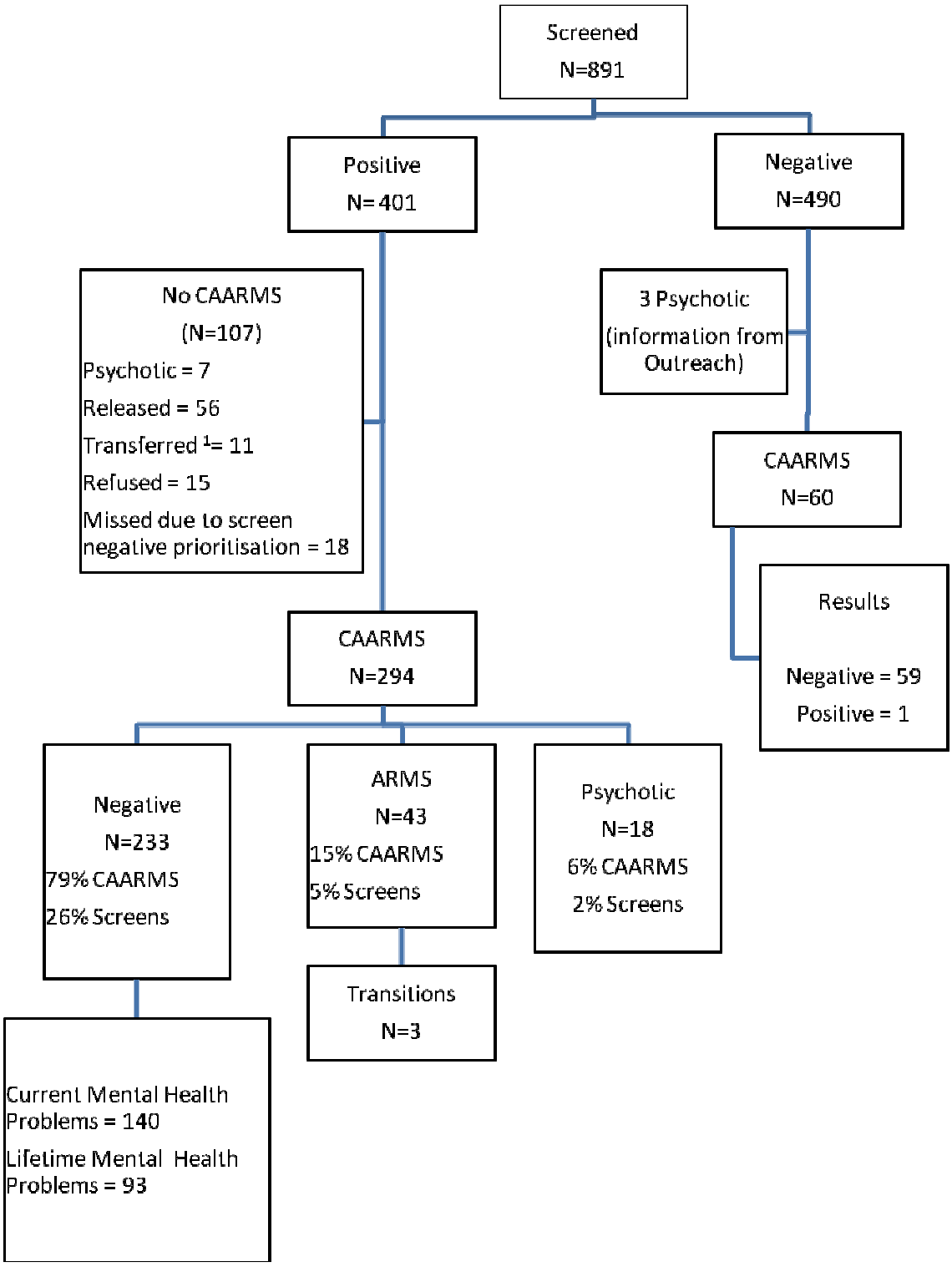
8.1 Hypothesis:

Prison participants who were assessed as having an ARMS would have correlates of social exclusion (homelessness, unemployment, no qualifications); higher levels of childhood trauma; higher levels of substance misuse; and different patterns of offending compared to those who were negative for ARMS.

8.2 Sample

Three hundred and fifty-four participants underwent the CAARMS assessment. 292 were negative, 44 were positive (including one person who had screened negative), and 18 were psychotic (See Figure 3). For the purposes of analyses the 7 individuals found to be psychotic at screen were included in the final analyses making the total number of people in the psychotic group 25. Three of these required immediate transfer to the inpatient wing due to their high risk to self. The 44 people who met criteria for ARMS all did so on the basis of attenuated symptoms, in addition to which four participants also had a first degree family history of psychosis. We were able to discover that 3 of the ARMS group later made transition to psychosis while in prison.

Figure 3: Consort Chart Screens to CAARMS Outcome



[1]Prisoners who had transferred in from other prisons rather than being received from court.

Of the 292 CAARMS Negatives, 233 were 'False Positives', they had screened positive but then not met criteria for ARMS. The remaining 59 were 'True Negatives'. They had screened negative and did not meet criteria for ARMS.

8.3 Mental Health

Participants who were False Positives had either current mental or lifetime mental and emotional problems including:

- either already having or meeting criteria for other diagnoses during assessment
- having experienced recent adverse life events
- ongoing severe emotional problems

The first group included individuals with diagnoses of personality disorder, depression, post-traumatic stress disorder, and alcohol or substance misuse. The second group referred to the participant having experienced a psychologically or physically profound event that had occurred recently enough that it continued to impact strongly on the individual concerned (e.g. having been recently injured from an assault or accident, a bereavement, or a relationship break up). The last group included issues that dated back years but which still caused high levels of distress in the person (e.g. one participant had been shot in the head four years previously, the bullet was still lodged in his head, being too dangerous to remove. The shooting had had a huge impact on his life, not least because the perpetrator remained at large. Other examples were of participants who had come from extremely abusive families and continued to experience ongoing problems with their families, ongoing anger issues related to family situations).

The remainder of the negatives (N=59) were 'True Negatives', they had screened negative and did not meet criteria for ARMS. There was a consensus within the clinical group carrying out the assessments,

that participants who had screened negative presented with considerably fewer current or lifetime mental or social difficulties than participants who screened positive, and reported little or no current distress. An analysis of mental health variables (PQ-B items endorsed, family psychiatric history, previous self harm and attempted suicide, and self ratings of anxiety and depression) confirmed that there were stark differences between the True Negatives and False Positive groups. Table 14 shows differences between groups in the endorsement of PQ-B items and distress on the items. The True Negatives group endorsed significantly fewer items than the False Positive group who in turn endorsed significantly fewer items than the ARMS group. The ARMS and Psychotic groups hardly differed in number of PQ-B items endorsed. The same pattern was evident for distress on items.

Table 15 shows the data from the CAARMS. Participants can be rated between 0 (no symptom) to 6 (Psychotic) on each scale. The data below shows the median scores for each group on the scales with the inter-quartile range in brackets. The inter-quartile range is the range of scores of the middle 50% of the group (25^{th} to 75^{th} percentile). It effectively discounts the bottom and top 25% of scores so that extreme scores are ignored. Even when the medians are the same, groups can differ significantly if one group has a larger number of scores at the higher end of the scale and the other at the lower end. The True Negative group differed significantly from the False Positive group on all items except for Mania. The False Positive group in turn differed from the ARMS group in terms of the first four scales which is to be expected since by definition the CAARMS distinguishes the individuals who are on the psychotic spectrum to those who are not based on these scales. However, the differences between the False Positive and ARMS group even out somewhat on the clinical ratings for anxiety, depression and suicidal ideation, although anxiety is still significantly higher in the ARMS group compared to the False Positive group. The Psychotic group score significantly higher also on the first four scales (except for disorganised speech frequency and duration) as would be expected. However, the differences between the two

groups even out on the mood scales except for Mania where the Psychotic group have more individuals scoring at a higher level.

The True Negative and False Positive group have the same median and inter-quartile range for two of the scales, Mania and Suicidality, yet there is a significant difference between the two groups for the latter, and trend for the former. In the case of Mania severity and intensity, this is because, while most of the scores for the False Positive group are 0, the range of total scores is from 0-3, while in the True Negative group, all participants had a score of 0. Table 16 shows the total scores for the positive symptoms scales for each group as well as total scores for the mood scales with interquartile ranges. The table shows a continuum of scores with the True Negative group having the lowest median, followed by the False Positive Group, then ARMS and the Psychotic group having the highest total scores. The interquartile ranges show the variance of scores also differs along the same continuum pattern.

Table 14: PQ-B Items

	True Negatives (N = 59)	False Positives (N = 233)	ARMS (N = 44)	Psychotic (N = 25)	TN vs FP	FP vs ARMS	ARMS vs PSY
			Mean (s.d.)			**p**	
Number of Items endorsed	1.8 (1.7)	13.2 (6.3)	16.5 (7.4)	19.5 (6.8)	**.000**	**.002**	.107
Number of Items with Distress	.54 (.92)	7.5 (5.4)	10.8 (5.8)	11.8 (5.9)	**.000**	**.000**	.526

Table 15: CAARMS Scores Median (Interquartile Range)

TOTAL SCORE ON ITEM	True Negatives (N = 59)	False Positives (N = 233)	ARMS (N = 44)	Psychotic (N = 18)	TN vs FP	FP vs ARMS	ARMS vs PSY
			Unusual Thought Content			p	
Severity	0 (0-0)	0 (0-1)	2.5 (1-4)	5 (4-6)	**.001**	**.000**	**.000**
Frequency and Duration	0 (0-0)	0 (0-2)	3 (2-4)	4 (3-5)	**.000**	**.000**	**.03**
			Non Bizarre Ideas				
Severity	0 (0-0)	1 (0-2)	4 (3-5)	5 (4-5)	**.000**	**.000**	**.002**
Frequency and Duration	0 (0-0)	1 (0-3)	4 (3-4)	5 (3-5)	**.000**	**.000**	**.03**
			Perceptual Abnormalities				
Severity	0 (0-0)	0 (0-2)	3 (0-2)	5 (2-5)	**.000**	**.000**	**.001**

Frequency and Duration	0 (0-0)	0 (0-2)	3 (1-4)	4 (2-4)	**.000**	**.000**	**.02**
			Disorganised Speech				
Severity	0 (0-0)	0 (0-2)	2 (1-3)	3 (2-4)	**.000**	**.000**	**.03**
Frequency and Duration	0 (0-0)	0 (0-2)	3 (2-4)	4 (2-5)	**.000**	**.000**	.12
			Mania				
Severity	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-1)	.061	.31	.06
Frequency and Duration	0 (0-0)	0 (0-0)	0(0-0)	0(0-1)	.061	.34	**.05**
			Depression				
Severity	0 (0-1)	1 (0-2)	2 (0-3)	2 (0-3)	**.001**	**.08**	.70
Frequency and Duration	0 (0-1)	2 (0-3)	3 (0-4)	4 (0-5)	**.000**	.37	.32
			Anxiety				
Severity	0 (0-0)	0 (0-2)	2 (0-3)	0.5 (0-3)	**.002**	**.02**	.39
Frequency and Duration	0 (0-0)	0 (0-3)	2 (0-4)	1 (0-3)	**.005**	**.03**	.31
			Suicidality				
Severity	0 (0-0)	0 (0-0)	0 (0-2)	0 (0-2)	**.003**	.31	.61
Frequency and Duration	0 (0-0)	0 (0-0)	0 (0-1)	0 (0-2)	**.004**	.31	.68

Table 16: CAARMS Total Range

	True Negatives (N = 59)	False Positives (N = 233)	ARMS (N = 44)	Psychotic (N = 25)	TN vs FP	FP vs ARMS	ARMS vs PSY
			Median (Interquartile Range)				
			Positive Symptom - Severity				p
Severity	0 (0-1)	3 (0-5)	10 (7-14)	17 (10-20)	**.000**	**.000**	**.000**
Frequency and Duration	0 (0-2)	4 (0-7)	11 (8-15)	13 (10-18)	**.000**	**.000**	**.03**
			Mood Symptom - Severity				
Severity	0 (0-2)	2 (0-5)	4 (0-7)	5 (0-9)	**.000**	**.02**	**.52**
Frequency and Duration	0 (0-2)	2 (0-6)	5 (0-7)	6 (0-9)	**.000**	**.07**	**.29**

Table 17 shows how the groups differed in self ratings for anxiety and depression, and on clinical ratings of functioning. The True Negative group rated themselves significantly less anxious and depressed than the False Positive group, the False Positive group had significantly lower ratings for depression, but not anxiety, compared to the ARMS group, while the ARMS and Psychotic groups had similar ratings for both anxiety and depression. The False Positive group also had significantly lower self rating for depression than ARMS (t =-2.65, 275df, p=.008). Lowest and highest functioning scores among the groups followed a similar pattern, the True Negative differing significantly from the False Positive group, who in turn differed from the ARMS group, who did not differ greatly from the Psychotic group. The exception to the pattern was the difference in drop in functioning, where the True Negative and False Positive groups did not differ, but the False Positive did differ from the ARMS group. The ARMS group displayed the largest drop in functioning of all the groups.

Table 17: Self ratings for anxiety and depression (scale 0-10) and Functioning scores

	True Negatives	False Positives	ARMS	Psychotic	TN vs FP	FP vs ARMS	ARMS vs PSY
	Mean (sd)					p	
Anxiety	3.1 (3.3)	6.7 (2.9)	7.3 (2.7)	6.8 (2.6)	**.000**	.217	.542
Depression	3.4 (3.5)	6.5 (3.1)	7. 8 (2.2)	7.3 (2.7)	**.000**	**.008**	.356
Highest SOFAS	75.3 (8.2)	69.8 (12.5)	65.1 (11.3)	60.0 (14.1)	**.001**	**.023**	.135
Lowest SOFAS	71.4 (9.1)	65.1 (13.3)	57.1 (10.9)	55.3 (12.0)	**.001**	**.000**	.599
Drop	4.0 (6.6)	4.7 (8.0)	8.2 (9.0)	4.7 (7.8)	.472	**.009**	.154

Table 18 shows information on mental health history of the groups. The True Negative group have the lowest rates of family psychiatric history of any kind compared to the other groups. In the case of general family history of psychosis, this reaches significance level in comparison

with the False Positive group (Odds Ratio: 3.3, 95% CI: .981-11.310). The False Positive group in turn, have lower rates than the ARMS group, again with this reaching significance level for general family history of psychosis (Odds ratio: 2.36, 95% CI: 1.085-5.140). However, the ARMS group have slightly higher rates of psychosis in the family, first degree or general, compared to the psychotic group, but these differences were not significant.

We also collected data on self harm and attempted suicide. The True Negative group showed significantly lower rates on all items except self harm in the last year compared to the False Positive group. The False Positive, ARMS and Psychotic groups did not differ significantly from each other. Noticeably, the Psychotic group had the highest rates of lifetime and current self harm and attempted suicide.

Table 18: Family Mental Health History

	True Negatives	False Positives	ARMS	Psychotic	TN vs FP	FP vs ARMS	ARMS vs PSY
	% (N)				p		
Family History Psychosis	5 (3)	16 (32)	31 (12)	23 (5)	**.04**	**.03**	.50
First Degree FH Psychosis	5 (3)	10 (20)	18 (7)	14 (3)	.29	.14	.66
First Degree FH Other	9 (5)	13 (27)	13 (5)	18 (4)	.35	.93	.57
Lifetime Self Harm	2 (1)	18 (42)	25 (11)	32 (8)	**.002**	.28	.53
Self Harm in last year	0	5 (12)	9 (4)	16 (4)	.07	.30	.39
Lifetime Suicide Attempt	2 (1)	29 (67)	39 (17)	60 (15)	**.000**	.19	.09
Suicide attempt in last year	0	10 (24)	18 (8)	28 (7)	**.01**	.13	.34

The True Negative group differed quite prominently from the False Positive group and we were therefore reluctant to merge these groups together for fear of losing an appreciation of the differences between the groups. Data from the Psychotic group is provided as a reference

point in the sense that the ARMS group should lie on the continuum between the negative and Psychotic groups. We therefore decided to carry out comparisons between the ARMS group with the True Negative and the False Positive groups as well as the Psychotic group to illustrate the continuum.

The analyses were carried out in three stages: first chi-squared analyses were carried out comparing the ARMS group with the other groups on individual items from each category. Secondly, a set of intermediary logistic regression analyses were carried out for each section to reduce the number of predictor variables for the final model. Binary logistic regression comparing ARMS with each of the negative groups was used rather than multinomial due to the True Negative and False Positive groups having different predictors.

8.4 Social Exclusion

Table 19 shows the data relating to social exclusion. The National Statistics Socio-economic Classification was used to classify occupation of each parent (NS-SEC; reference: http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/index.html#6). The highest of the parent's classification was then taken as parental social class. The ARMS group did not differ from the other groups in terms of rates of unemployment, being in short term accommodation prior to prison reception, or age at which they left full time education. The ARMS group were, however, significantly more likely to have no qualifications than either the True Negative or the False Positive groups. They were also more likely to have been homeless before prison compared to these groups.

Table 19: Social Exclusion

	True Negatives N=59	False Positives N=233	ARMS N=44	Psychotic N=25	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	% (N)				P		
No qualifications	22 (13)	36 (78)	50 (22)	36 (9)	**.003**	**.04**	.26
Unemployed	51 (30)	60(140)	64 (28)	68 (17)	.21	.66	.72
Short term accommodation	32 (19)	39(90)	46 (20)	60 (15)	.17	.41	.25
Homeless before prison	2 (1)	11(26)	18 (8)	20 (5)	**.003**	.19	.85
Parental Social Class ≥ 5	88 (44)	82 (148)	85 (28)	96 (21)	.68	.71	.22
	Mean (sd)						
Age education ended	16.73(3.3)	16.1 (3.4)	15.8(2.9)	16.4 (3.8)	.15	.55	.48

8.5 Childhood Adverse Experiences

Table 20 shows the figures for how many participants in each group had experienced any of the eight Childhood Adverse Experiences (including a breakdown of illness, injury or assault to see whether the injury was caused by violence) before the age of 17. The ARMS group had significantly higher rates on all items except two compared to the True Negative group. Even on the two items which were not significantly different, being in care and having experienced an illness, assault or injury, the rates in the ARMS group which much higher though not reaching significance levels. The notable pattern in this table is that the Psychotic group have the highest rates of adverse experiences of all the groups and the True Negative the lowest rates. In addition all eight items were added together and entered as a continuous variable in a logistic regression to calculate the cumulative effect of childhood adversity on having an ARMS. Compared to the True Negative group, the odds of having an ARMS almost doubled for every Childhood Adverse Experience that an individual had experienced.

Table 20: Childhood Adverse Life Events Yes/No

	True Negatives	False Positives	ARMS N=44	Psychotic N=25	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	% (N)				P		
Bullied	17 (10)	47 (109)	59 (26)	68 (17)	**.000**	.15	.46
Physical abuse	32 (19)	63 (146)	64 (28)	72 (18)	**.002**	1.1	.48
Witnessing family violence	22 (13)	58 (134)	64 (28)	76 (19)	**.000**	.49	.29
Separation	32 (19)	60 (138)	57 (25)	64 (16)	**.01**	.72	.56
In care	20 (12)	37 (85)	34 (15)	32 (8)	.12	.73	.86
Sexual abuse	5 (3)	16 (36)	23 (10)	36 (9)	**.008**	.25	.23
Illness, injury or assault	25 (15)	52 (120)	43 (19)	72 (18)	**.06**	.29	**.02**
Injury by violence	3 (2)	21 (49)	16 (7)	28 (7)	**.03**	.44	.15
Racial discrimination	15 (9)	35 (80)	34 (15)	52 (13)	.03	.96	.23
Cumulative (OR CI 95%)					**1.95 (1.477 – 2.58)*** **	1.05 (.868-1.277)	**1.38 (1.018 – 1.871)[1]***

***p<.001 [1]Ref Group: ARMS*p<.05

There were no differences between the ARMS and False Positive groups in number of Childhood Adverse Experiences. However, the odds of being in the Psychotic group compared to the ARMS were almost 1.4 for every Childhood Adverse Experience.

We also examined the age of onset of each event and between what ages the event had taken place but found just one difference between the ARMS and other groups (Table 1, Appendix F). The ARMS group had been taken into care at a significantly younger age than the False Positive group. A further analysis examining the length of time in months over which participants had experienced adverse events revealed no differences between the ARMS and other groups (Appendix F, Table 2). A breakdown of the type of discrimination experienced and whether it occurred during childhood or adolescent identified a difference between the ARMS compared to the Psychotic group with the latter having experienced higher levels of discrimination as teenagers compared to the former group. The ARMS group in contrast had experienced higher levels of discrimination as children compared to the Psychotic group (Appendix F, Table 3).

8.6 Substance Misuse

The ARMS group was compared to the other groups with regards to lifetime use and use in the month prior to prison reception of alcohol and substances. Table 21 shows the numbers of people in each group that had ever used alcohol or other substances. Prevalence of use was higher in the ARMS group for nine of the 12 substances (including 'other'), compared to the True Negative group, but there were no differences compared to the False Positive and the Psychotic groups. Again the pattern shows the True Negative have the lowest rate of drug use, with use in the False Positive, ARMS and Psychotic groups being similar.

Table 21: Lifetime Substance Use

	True Negatives	False Positives	ARMS N=44	Psychotic N=25	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	% (N)				P		
Alcohol	73 (43)	88 (204)	86 (38)	84 (21)	.09	.83	.79
Cigarettes	68 (40)	92 (215)	96 (42)	88 (22)	**.001**	.45	.25
Weed	78 (46)	89 (207)	91 (40)	76 (19)	**.08**	.69	.09
Skunk	66 (39)	88 (205)	86 (38)	88 (22)	**.02**	.76	.85
Inhalants	7 (4)	18 (42)	16 (7)	12 (3)	.14	.74	.66
Crack	22 (13)	44 (103)	48 (21)	56 (14)	**.006**	.67	.51
Cocaine	27 (16)	54 (126)	64 (28)	64 (16)	**.000**	.24	.98
Stimulants	24 (45)	46 (107)	57 (25)	48 (12)	**.001**	.18	.48
Sedatives	15 (9)	39 (90)	32 (14)	48 (12)	**.05**	.39	.18
Opiods	15 (9)	28 (64)	30 13)	32 (8)	**.08**	.78	.83
Hallucinogens	10 (6)	31 (73)	32 (14)	32 (8)	**.006**	.95	.99
Other	12 (7)	26 (61)	25 (11)	40 (10)	.08	.87	.19

The next table shows the use of alcohol and substances within the month prior to reception (Table 22). We used the maximum weekly allowance for alcohol as recommended by the NHS of >3-4 units per day as a cut off point for alcohol use (www.nhs.uk/conditions/alcohol-misuse). Neither inhalants nor hallucinogens had been used by anyone in the groups in the time period measured and were therefore omitted from the table. Of the remaining nine substances, the ARMS group were significantly more likely than the True Negative group to have used eight of the substances, the exception being opiods. Heavy use of skunk (the stronger type of cannabis), defined as >7 joints per day did not differ between groups. A variable was created combining recent use of crack and/or cocaine and/or any stimulants and comparisons were made between the ARMS and other groups on this variable. The ARMS group had significantly higher use of any stimulant than the True Negative group, but not compared to the False Positive or Psychotic group. The ARMS group did not differ from the False Positive group on any recent drug use, and from the Psychotic group only in that the ARMS group were more likely to have smoked cigarettes in the month prior to reception.

Table 22: Substance Use prior to reception

	True Negatives	False Positives	ARMS N=44	Psychotic N=25	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	% (N)				P		
Alcohol >21 units/week	9 (5)	40 (92)	34 (15)	32 (8)	**.001**	.50	.86
Cigarettes	61 (36)	90 (209)	93 (41)	76 (19)	**.000**	.47	**.05**
Weed	32 (19)	52 (122)	55 (24)	56 (14)	**.02**	.79	.91
Skunk	41 (24)	58 (134)	61 (27)	72 (18)	**.04**	.63	.37
Skunk > 7	17 (4)	27 (36)	26 (7)	33 (6)	.42	.95	.59
Crack	7 (4)	24 (55)	27 (12)	24 (6)	**.005**	.60	.76
Cocaine	5 (3)	18 (41)	30 (13)	20 (5)	**.001**	.07	.38
Stimulants	0	6 (15)	11 (5)	0	**.008**	.25	.08
crack, cocaine or stimulants	10 (6)	36 (83)	43 (19)	36 (9)	**.000**	.34	.56
Sedatives	2 (1)	22 (50)	21 (9)	32 (8)	**.001**	.88	.28
Opiods	7 (4)	20 (47)	14 (6)	12 (3)	**.25**	.31	.85

Table 23 shows the mean age at which the participants had started using substances socially or regularly. Of the eleven substances, the ARMS group were more likely to have used four at a significantly earlier age than the True Negative group, none of them class A substances. In comparison to the other groups the ARMS group differed only in that they began use of hallucinogens at a younger age than the Psychotic group.

Since participants were screened in the first seven days following reception, we knew that their screening symptoms could be drug related. In those individuals who had been using drugs we tried to delay the CAARMS by at least a further seven days in order to allow substance abuse/withdrawal symptoms to abate. Table 24 shows the length of time between being seen for the screen and the CAARMS made a difference to outcome, but there were no differences on these variables between the ARMS and other groups. The ARMS group were, however, more likely to rate their drug use as problematic compared to the True Negative group, but not the other groups. In addition, we checked to see if currently receiving detoxification medication made a difference to outcome, but there were no differences on these variables between the groups (Appendix F, Table 4).

Table 23: Substance Use: Age started

	True Negatives	False Positives	ARMS N=44	Psychotic N=25	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	Mean (s.d.)				P		
Alcohol	17.2 (3.1)	15.3 (3.8)	14.8 (4.2)	15.3 (3.2)	**.004**	.46	.65
Cigarettes	16.1 (3.7)	13.8 (3.8)	13.7 (3.7)	14.3 (2.5)	**.006**	.80	.49
Weed	16.6 (3.7)	14.1 (3.3)	14.1 (3.4)	14.7 (2.4)	**.002**	.98	.46
Skunk	17.3 (2.9)	15.5 (4.2)	15.7 (3.8)	15.7 (4)	**.05**	.85	.98
Inhalants	13.2 (1.5)	12.5 (2.3)	13.4 (2.2)	17.0 (3.5)	.89	.31	.08
Crack	21.1 (4.7)	19.2 (4.8)	18.6 (3.8)	19.5 (4.4)	.13	.51	.54
Cocaine	20.7 (5.2)	19.5 (4.3)	18.4 (4.9)	19.3 (3.2)	.14	.23	.49
Stimulants	19.1 (4.3)	17.7 (4.5)	17.4 (3)	18.1 (2.5)	.19	.74	.59
Sedatives	23.1 (10.3)	20.7 (5.3)	21.0 (6.7)	23.6 (5.6)	.56	.86	.30
Opiods	24.2 (5.6)	21.2 (5.6)	21.4 (4.4)	22.6 (5.2)	.20	.91	.57
Hallucinogens	18.0 (3.7)	16.3 (4)	16.3 (2.9)	19.6 (4.3)	.29	.99	**.05**

Table 24: Current influence of substances

	True Negatives	False Positives	ARMS N=44	Psychotic N=25	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	Mean (s.d.)				P		
Days Screen to CAARMS	7.1 (7.5)	13.2 (30.1)	8.7 (12.8)	5.2 (7.9)	.41	.33	.22
Problematic Use	2.8 (4.1)	5.7 (4.8)	7.1 (4.6)	6.4 (4.7)	**.000**	.07	.54

8.7 Criminal Justice System Data

Offences were re-categorised in line with 'counting rules' for recorded crime developed by the Home Office (http://www.homeoffice.gov.uk/science-research/research-statistics/crime/counting-rules/). Some participants were held on multiple offences in which case the most serious offence was considered as the index offence (Table 25).

Table 25: Offences

Offence	True Negative	False Positive	ARMS	Psychotic
Violence against the person	34 (20)	29 (68)	30 (13)	48 (12)
Sexual Offence	7(4)	4 (10)	7 (3)	4 (1)
Robbery	10(6)	8 (19)	9 (4)	4 (1)
Burglary	4(2)	16 (37)	11 (5)	8 (2)
Theft/Handling of stolen goods	5(3)	7 (17)	7 (3)	16 (4)
Fraud/Forgery	5(3)	2(5)	0 (0)	0
Drug Offences	22 (13)	13 (31)	9 (4)	12 (3)
Motoring Offences	5(3)	6 (14)	7(3)	4(1)
Other	8(5)	14 (32)	21 (9)	4(1)

Violence against the person is a broad category that covers a wide range of violent offences from common assault which can be defined as spitting at a person or pushing them, through to actual and grievous bodily harm, to murder. Other offences included: breach of curfew or probation, public order offences, contempt of court, affray. For the purposes of analysis, offences were reduced to binary violent versus non violent for comparisons between groups (Table 26). There were no significant differences between the ARMS and other groups. Table 26 shows data collected regarding participants current legal status, experience of prison and offence within the criminal justice system. We asked participants whether this was their first time in prison custody and found no significant differences between the ARMS group and any of the other groups as to how many were first receptions. We also asked if they were awaiting trial or convicted. The ARMS group had the lowest proportion of participants who were

awaiting trial and the Psychotic group had the highest. The difference between the two was statistically significant.

Table 26: Criminal Justice System Data

	True Negatives	False Positives	ARMS	Psychotic	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	% (N)				P		
First Reception	34 (20)	21 (49)	21 (9)	20 (5)	.13	.91	.96
Awaiting Trial	59 (35)	59 (138)	46 (20)	84 (21)	.16	.09	.002
Offence							
[1.] Non Violent Offences	58 (34)	62 (144)	56 (24)	48 (12)	.75	.34	.60
[2.] Violent Offences	42 (25)	38 (89)	44 (20)	52 (13)			

[1.] Non Violent Offences included: breach of licence, affray, theft, motoring offences, drug offences, possession of weapon, criminal damage

[2.] Violent Offences: violence against the person, sexual offences, robbery, aggravated burglary, kidnapping, arson with intent to endanger life

8.8 Second stage analyses

The first stage analyses identified 30 differences between the ARMS and True Negative group and just 2 differences between ARMS and the False Positive group. Separate binary logistic regression analyses were therefore used to identify predictors of ARMS compared to the False Positive and the True Negative groups. Table 27 shows the results of the regression analyses with outcome False Positive or ARMS. The groups differed significantly on just three items in the chi-squared analyses, and when entered into the regression model, just one emerged as a significant predictor for ARMS outcome: the age at which children went into care, with the ARMS group being significantly younger at the time they went into care than the False Positive group.

Table 27: Binary Logistic Regression with Outcome ARMS or False Postive

	B	s.e.	wald	df	sig	Exp (b) CI 95%
No Qualifications	.417	.581	.515	1	.473	1.52 (.486 – 4.737)
Age went into care	-.133	.059	5.005	1	.025	.88 (.780 - .984)
constant	-.463	.742	.390	1	.532	.63

In order to carry out a regression analysis examining ARMS and True Negative as outcomes, it was necessary to reduce the number of possible predictors. Regression analyses require one predictor per minimum ten cases of the predicted outcome (Peduzzi et al., 1996). Since there were 44 people with ARMS, the differences found at the first stage of analyses needed to be reduced down to a maximum of three or four to enable a meaningful logistic regression to be carried out. Our hypothesis predicted four broad areas of difference: social exclusion, childhood adverse events, substance misuse and criminal justice system patterns. Since the groups did not differ on criminal justice system data at the initial stage of analysis, these variables were omitted from any further analyses. Variables from the mental health section

were also omitted from any further analyses as they either are not relevant in terms of predictors (e.g. self harm or suicide) or they are known to be highly correlated with ARMS (e.g. anxiety, depression, family psychiatric history). Any variable with a cell count of less than five in a particular group was excluded from further analyses as small cell counts can inflate the regression co-efficient and the make the model unstable (Menard, 2010). This resulted in the following variables being omitted from further comparisons between the ARMS and True Negative groups: homelessness; sexual abuse; injury by violence; and recent individual use of crack, cocaine and stimulants.

The remaining 24 variables were grouped into the hypothesis areas of childhood adversity and substance misuse and entered into individual logistic regressions with a view to seeing which predictors could be removed from the analysis. Those variables that met up to $p<.05$ significance levels were carried through to the final stage. Since 'no qualifications' was the only variable from the social exclusion area, this was entered into the final model.

Table 28 shows the steps that led to the final model for the ARMS versus True Negative groups. In the final model, rather than use the two individual predictors of Childhood Adversity that had emerged as significant (bullying and witnessing family violence), the Cumulative Child Adversity score was used instead. This comprised the total number of events that participants had endorsed. This predictor was used instead of the individual predictors since the Wald statistic indicated it would be a better predictor. The predictors which emerged as significant for the final model were: No qualifications, Cumulative Childhood Adversity, and Problematic Substance Use. The ARMS group were four times more likely than the True Negative group to have no qualifications. The odds of having an ARMS doubled for every childhood adverse life event experienced. The odds of having an ARMS also increased by one

and half times for every half point increase in self rating of Problematic Substance Use compared to the True Negative group. The model accounts for 38% of variance in predicting an outcome of ARMS. These results were not subject to multicollinearity effects (tolerance values: .94, .90, and .84; corresponding VIF values: 1.07, 1.12 and 1.21). Bonferroni corrections were not carried out as the analyses are exploratory and the odds ratios with confidence intervals are reported.

Table 28: Binary Logistic Regression with Outcome ARMS or True Negative

	B	s.e.	wald	df	sig	Exp (b) CI 95%
Step 1: Childhood Adversity						
Bullied	1.74	.51	11.40	1	.001	5.68 (2.072 –
Hit	.03	.59	.003	1	.96	15.549)
Witness family violence	1.49	.58	6.69	1	.01	1.03 (.322 –
Separation from parents >1 year	.50	.53	.92	1	.34	3.311)
Discrimination	.95	.45	2.67	1	.10	4.44 (1.435 –
Step 2: Cumulative Childhood	.67	.14	22.09	1	.000	1.95 (1.477 –
Step 3: Lifetime Substance						
Misuse	1.70	.84	4.11	1	.04	5.44 (1.057 –
Cigarettes	.45	.61	.54	1	.46	27.988)
Skunk	.18	.58	.10	1	.75	1.56 (.474 –
Sedatives	.64	.62	1.06	1	.30	5.157)
Hallucinogens	.67	.52	1.62	1	.20	1.20 (.383 –
Step 4: Current Substance						
Misuse	.64	.65	.97	1	.33	1.90 (.531 –
>21 units alcohol/per week	1.64	.76	4.70	1	.03	6.727)
Cigarettes	.82	.82	2.41	1	.12	5.13 (1.169 –
Cannabis use	1.07	1.07	3.0	1	.08	22.559)
Any stimulant substances	1.72	1.14	2.35	1	.13	2.27 (.806 –
Step 5: Substance Misuse						
Age began alcohol use	-.01	.11	.00	1	.95	1.0 (.809 –
Age began cigarette use	-.25	.15	2.94	1	.09	1.219)
Age began weed use	.00	.14	.00	1	.98	.78 (.587 –
Age began skunk use	.02	.11	.04	1	.84	1.036)
Problematic Use	.48	.19	6.14	1	.01	1.0 (.765 –
Final Model: Stage One						
Qualifications	1.68	.62	7.40	1	.007	5.34 (1.598 –
Cumulative Child Adversity	.68	.17	16.05	1	.000	17.848)
Cigarettes in last month	2.08	.94	5.14	1	.03	1.96 (1.412 –
Problematic Use Substances	.41	.15	7.32	1	.007	2.733)

Final Model: Stage Two						
Qualifications	1.42	.57	6.18	1	.01	4.15 (1.351 –
Cumulative Child Adversity	.68	.16	17.63	1	.000	12.718)
Problematic Use Substances	.44	.14	9.28	1	.002	2.17 (1.434 –
Constant	-3.65	.74	24.42	1	.000	2.696)

8.9 Discussion

This study sought to examine differences between prisoners with an ARMS compared to those who did not have an ARMS. We hypothesised that compared to prisoners without ARMS, prisoners with ARMS would have experienced higher levels of i) social exclusion ii) childhood adverse life events iii) substance misuse and iv) that they would differ in the pattern of criminal justice system data. There was agreement within the clinical team carrying out the assessments that participants who had screened negative presented with considerably fewer social problems and less distress than participants who screened positive but had then not met criteria for ARMS, i.e. were false positives. Subsequent analyses of PQ-B and CAARMS items, as well as other mental health variables confirmed that these groups did in fact have different profiles.

Differences in self ratings of anxiety and depression were most marked between the ARMS and the True Negative group with the groups rating themselves towards opposite ends of the scale. Differences between the ARMS and Psychotic groups were negligible indicating that these groups are experiencing a high level of distress. The False Positive group was substantially different to both the ARMS but also to the True Negative group indicating again that these prisoners are psychologically different to a healthy control sample. The ARMS group gave the highest self ratings of depression, significantly higher than the True Negative and the False Positive groups. Depression in particular has been linked to outcomes of both transition to psychosis is the UHR population (Yung et al., 2003; Yung et al., 2004;) More importantly, depression is thought to be a core symptom of the psychosis prodrome and therefore crucial in both detection and treatment of ARMS (Hambrecht et al., 1994; Hafner et al., 1999; Fusar- Poli et al, 2012a). It has been speculated that the early treatment of mood disorders such as depression has contributed to the prevention of transition to psychosis (Yung et al., 2003, Fusar- Poli et al, 2012a).

The pattern of functioning scores shows the True Negative to have the highest functioning, followed by the False Positive, then ARMS with the Psychotic group having the lowest scores. Unsurprisingly the psychotic group do not have a huge drop in functioning as presumably they have already experienced a loss of social and other networks in the process of becoming unwell. Indeed their highest score on the SOFAS was 60 which is indicative of 'moderate difficulty in social and occupational functioning. The decrease in functioning forms part of the criteria for ARMS due to its association with psychosis (Addington et al., 2008; Yung et al., 2004; Mason et al., 2004).

The high rate of both self harm and attempted suicide among individuals with first episode psychosis has already been documented, with completed suicide rates of 3% over a 4 year follow up period (Clarke et al., 2006), attempted suicide prevalence of 12% over a two year follow up period (Sanchez-Gistau et al., 2013), and self harm rates of 11% (Harvey et al., 2008). Our data confirmed the vulnerability of this group with the Psychotic group having the highest rates for self harm, but in particular suicidal attempt, both lifetime and recent. Research on self harm and suicide in the ARMS population has found high levels of suicidal ideation (Preti et al., 2009; Barrett et al., 2010). The ARMS group in this study differed substantially from the True Negative group who reported very low self harm and suicide rates. Rates of self harm and attempted suicide differed greatly between the True Negative and False Positive group. The False Positive, ARMS and Psychotic groups had ascending rates of self harm and suicide but did not from each other.

We examined family psychiatric history of the groups and found that in terms of psychosis, the ARMS group showed higher levels for both first degree and general family history of

psychosis across the board even compared to the psychotic group. This was to be expected given that family history form part of the ARMS criteria. Most notably, the groups differed in that the True Negative and False Positive groups had substantially higher rates of non psychotic mental disorder in the family compared to the ARMS and Psychotic groups. A first degree family history of psychosis is the single biggest predictor of psychosis (Agerbo et al., 2012; Goldstein et al., 2010), incurring a risk of between 7 to 10% lifetime chance of developing psychosis compared to 1% in those without family history (Gottesman, 1991 and 1993).

These findings revealed a profile of the True Negative group as having low both self reported and clinical ratings of anxiety and depression; low rates of self harm and attempted suicide; high levels of functioning; and low rates of psychosis in the family (although high rates of other psychiatric disorder). This was in marked contrast to the False Positive group on all these items. We therefore conceptualised the True Negative group as a healthy control group. In addition to the ARMS group, we also identified a number of participants who were in their first episode of psychosis. Compared to the False Positive group, the ARMS group were more likely to have no qualifications and to have been placed in care at an earlier age. They did not differ on any other social exclusion or childhood adversity factors nor in terms of substance misuse or criminal justice system data. Compared to the True Negative group, the ARMS participants were more likely to have no qualifications, to have experienced more childhood adverse life events, in particular to have experienced bullying and witnessing family violence, and also more likely to rate themselves as having problematic substance use.

The declining rates of transition to psychosis in the last decade have raised questions about the validity of the ARMS criteria. Initial transition rates were as high as 40% (Yung et al., 2003)

but have dropped to as low as 13.5% (Simon et al., 2010). Studies show that after a period of one to two years follow up, the majority of participants show full remission from UHR status (Simon et al., 2010; Ziermans et al., 2010). Various hypotheses have been put forward to explain the decrease including the follow up time period not being long enough to show up the transitions (Simon et al., 2010; Fusar-Poli et al., 2012b), early detection and treatment having a profound impact on prevention (Yung et al., 2003; French et al., 2007), but also whether the ARMS criteria detects a high rate of false positives (Yung et al., 2007). Simon et al. (2010) found a high rate of mood disorders among non converters. Simon et al. (2010) have been critical of the focus on positive symptoms in the UHR criteria and recent findings demonstrate the importance of negative symptoms in the onset of psychosis (Valmaggia et al., 2013; Demjaha et al., 2012). Our findings fit with the idea of a staged model of psychosis (McGorry et al., 2006 and 2010; Singh, 2010) in which individuals move up (and down) a continuum of psychotic like symptoms with a minority continuing until they reach a threshold for psychosis (Fusar-Poli et al., 2013).

8.9.1 Social Exclusion

We hypothesised that prisoners with an ARMS would be more socially excluded than those without an ARMS and measured this on a range of variables that can indicate marginalisation at the time but also lead to further exclusion (e.g. leaving school with no qualifications would increase the likelihood of unemployment). We found no differences between the groups in terms of unemployment which was most likely due the high levels of unemployment in the total sample (57%). Even the True Negative group who had the lowest rate of unemployment, had a rate of over 50% unemployment. These figures are consistent with previous studies of the UK prison population (Stewart, 2008; Her Majesty's Inspectorate of Prisons, 2001).

While there were no statistically significant differences in age at which the groups had left school, the mean age for the ARMS group was marginally lower than the other groups and was

just under 16 years. However, the ARMS group were more likely to have never achieved any qualifications compared to any of the other groups. This difference reached significance levels in comparison to the True Negative and the False Positive groups. It appears that the ARMS group were more likely than the True Negative or False Positive groups to leave school before sitting exams.

We also looked at stable accommodation problems which are known to be a major issue in both the prisoner and mentally ill population (Williams et al., 2012b; Rees, 2009). While differences between the ARMS and other groups in terms of whether they were in short term accommodation did not reach significance levels there is a clear trend in that the True Negative and False Positive have the lowest rates for being in short term accommodation followed by the ARMS group, with the Psychotic group having the highest rate. The profile for homelessness is more worrying, with very low rates in the True Negative group, but highest in the ARMS and Psychotic groups. This could be indicative of a slide in functioning. Homelessness is associated with a mental disorder in general (Friedman, 2010) and in particular with psychosis (Folsom et al., 2002, Rees, 2009), although it is an issue that has not to date been examined in the ARMS population.

8.9.2 Childhood Adverse Experiences

There has been growing evidence over the last decade that adverse experiences in childhood are strongly associated with mental disorder in general and in particular for psychosis (e.g. Varese et al., 2012). Our data show the True Negative group to have the lowest rates of childhood adversity and the Psychotic group to have the highest rates (except for being in care). These findings are similar to those of Bebbington et al. (2004) who found that of different mental disorders, the participants with psychosis had the highest rates for all adverse

life event items with the exception of the item of being expelled from school. Another notable factor is the large difference between the True Negative and the False Positive groups indicating further that these groups are qualitatively different. Neither the False Positive nor the Psychotic groups differed significantly from the ARMS group suggesting that while childhood adversity plays in a role in development of mental disorder, the details of how this evolves remains to be known.

The False Positive and the ARMS group were broadly similar in terms of Childhood Adverse Experiences rates. There have been questions raised whether some types of Childhood Adverse Experiences are more likely to be associated with psychosis than other (e.g. sexual abuse) but the evidence has been mixed. The authors of a meta-analysis of Childhood Adversity and psychosis concluded that there no particular trauma which is a stronger predictor than any other (Varese et al., 2012). They proposed that it is age of exposure and cumulative events that increase psychosis risk. The only difference we found in age of exposure was between the ARMS and the False Positive group in that the ARMS group went into care at a younger age than the False Positive group. There were no other differences between the ARMS and other groups in either terms of age of exposure or length of time Childhood Adverse Experience lasted. Our results confirmed previous findings by other authors that the more events a person experiences the greater their risk for psychosis (Shevlin et al., 2008; Varese et al., 2012). Again the continuum was apparent with the ARMS group having an increased risk compared the True Negative group, but a lower risk than the Psychotic group. Cumulative Childhood Adversity remained a strong predictor of ARMS in the final logistic regression model.

8.9.3 Substance Misuse

Our primary analyses found both lifetime and recent differences in cannabis use only in comparison with the True Negative group. We also found that the ARMS group started cigarette, alcohol and cannabis use earlier than the True Negative group. The influence of substances on the development of psychosis has become a major focus of enquiry in the last decade. The role of cannabis as a risk factor for psychosis has been investigated extensively. Cannabis use has been found in some studies to be associated with transition to psychosis in Ultra High Risk populations (e.g. Fergusson et al., 2003; Kristensen and Cadenhead, 2007). However, the evidence is mixed with other studies finding no association between the two (Philips et al., 2002), while others have found the risk is moderated by other factors such as having a vulnerability to psychosis (Verdoux et al., 2003; Henquet et al, 2005) and severe dependence (Farrell et al., 2002). Type of cannabis did not influence outcome, with both weed and skunk being significantly associated with ARMS. All positive groups had higher levels of both types of cannabis use than the True Negative group, raising the question as to whether other factors such as childhood adversity may mediate use of cannabis or other substances. Farrell et al (2002) have pointed out that the increase in cannabis use in the last two decades has not led to an increase in the prevalence rate of psychosis nor in a lower age of onset of psychosis.

Other substances that have been found to be positively associated with psychosis are stimulants. Farrell et al (2002) in a national survey of prisoners found psychosis to be associated with cocaine and amphetamine use prior to age 16 and to cocaine dependence. Heroin dependence was found to be negative associated with psychosis. We found that the ARMS group differed from the True Negative group in terms of use of any stimulants but this did not remain the case when entered into the final model with other predictors. No individual drug or group of drugs (e.g. stimulants) emerged as predictors in the final model. The final

model found that it was only the self reported problematic use of drugs that was predictive of ARMS outcome.

8.9.4 Criminal Justice System Data

It is already known from the literature that the first week in custody is a highly stressful time (Leese et al., 2006; Shaw et al., 2004). Much of the safer custody policies developed in the last two decades were in recognition of this early period in detention as a vulnerable time placing individuals at much higher suicide risk (Shaw et al., 2004). We thought that if the first week in custody was recognised as distressing for most prisoners, it must be more so for individuals coming to prison for the first time. This in turn could be a contributory factor to pushing an individual vulnerable to psychotic symptoms further along the psychosis continuum. However we found no differences between groups as to whether it was their first time in custody or not. One reason may be that prisoners often reported that while they were new to prison, most were not new to the idea of prison, or indeed institutional settings as a third of our participants had been in care as children, and this did not differ by group.

The time that prisoners spend awaiting trial is known to be highly stressful due to the uncertainty of case/trial outcome. Across the literature, levels of psychosis are generally higher among remand than convicted prisoners (Gunn et al., 1991; Birmingham et al., 1996: Singleton et al., 1998). We therefore thought it probable that there was also a higher rate of ARMS among the remand population. In fact we found no such difference, but we did confirm the higher rates of psychosis among prisoners who were awaiting trial as opposed to convicted. However, we have no way of knowing whether those who were psychotic made transition shortly after arrival in prison or had already been psychotic prior to reception.

We examined offending patterns thinking there may be some difference between the ARMS and other groups although were unclear in what direction it would lie. In fact we found no difference at all between ARMS and any other group. Notably no one in either the ARMS or Psychotic group had an index offence of fraud or forgery. These two groups also had very low rates of both drug and motoring offences. The data was examined for any association between group outcome and violent offences as this is a major source of research, debate and stigmatising beliefs about mental illness in general (Douglas et al., 2009; Evans-Lacko et al.,2012). However, we found no association between violent index offence and ARMS or Psychosis. Previous research has found the relationship between psychosis and violence is accentuated by co-morbid psychiatric disorder (Moran et al., 2003) and substance misuse (Douglas et al., 2009).

8.9.5 Strengths and Limitations

To the best of our knowledge when we began this study it was the first to examine ARMS in the prison population. Since we published our initial paper (Jarrett et al., 2012), there has been another study examining prevalence of ultra high risk state in a young offender population (Flynn et al., 2012, see Chapter 1, Section 1.2). Nevertheless, this remains the only study to be carried out in an adult prison. In addition it is one of the few studies to have examined ARMS in a non-help seeking population. All prisoners meeting eligibility criteria were approached for screening. The refusal rate was low as is usual in prison studies (Birmingham et al., 1996; Singleton et al., 1998). Due to the large numbers screened, we were able to identify clear subgroups within the population which support the notion of a continuum of symptoms and distress. Our prevalence rate of 5% ARMS of the total population screened suggests that we did not include people who were experiencing symptoms while under the influence of substances. On the contrary, the relatively lower prevalence compared to high psychosis rates of prisoners suggest that we may have been overly conservative in our

CAARMS ratings. Our findings support the notion of an 'imported vulnerability' model which has previously been used to explain the high rates of suicide in prisoners (Liebling, 1995, 2008). The model asserts that individuals who experience distress in prison are often already vulnerable before reception due to biopsychosocial factors and that the prison environment may serve just to exacerbate their vulnerability.

Unfortunately, lack of resources meant that we were not able to follow participants up which would have been useful to gauge a rate of transition to psychosis. As such, these findings are merely a 'snapshot' of the participants' mental health at the time of assessment. Without adequate follow up there is no way of knowing how the mental health of the participants would change over time. Also due to lack of resources, we were unable to include prisoners who did not speak English at a minimum level. This added stressor could be an important variable in a prison population which at some point must be explored. We were also unable to carry out second stage interviews due to participants being transferred or released which we had anticipated at the beginning of the study but recognised this was a logistical problem beyond our control. The method of randomisation was not ideal as the probabilities of selection were not strictly equal. However, we demonstrated that while this population were non help seeking, and had various opportunities to opt out of the assessment process, they nevertheless responded to the offer of help. They agreed to take part in the research, they endorsed items on the screening questionnaire, also reported distress on the items when asked, agreed to participate in the second stage assessment and agreed to be triaged to services. This is a strong indication that populations who do not actively help seek in the community are not actively rejecting help or perceiving it to be unnecessary.

Prison routines are such that in order to screen a high volume, the assessment tools had to be as short as feasibly possible while still allowing us to collect information required to be able to carry out comparisons between groups. This meant that we did not collect detailed data on the childhood adversity items which could have been useful for the analysis (e.g. relationship with perpetrator of sexual abuse; reason for going into care). The study was carried out in a male adult local prison with men awaiting trial or serving short sentences. The results cannot be generalised to female prisoners or young offenders, or prisoners serving long sentences, or to community populations.

Our ARMS group have a similar profile to the False Positive and the Psychotic group, suggesting that these individuals are experiencing a level of mental health difficulties that is associated with high levels of distress. The argument against ARMS and early detection services has been built largely on the basis of stigmatization of those who have these experiences. The similarity between groups raises the question of whether it is ethical to label people as being at risk for psychosis when they may actually be at risk of other mental health issues. However, it also raises the question of whether it is ethical to deny people help because they don't have sufficient symptoms or level of distress.

Chapter 9: A comparison between community help seeking participants with ARMS and prison participants with ARMS

This section examines the results of a comparison between the 44 prison participants who met criteria for ARMS and a community help seeking group of 42 male participants who met criteria for ARMS.

9.1 Hypothesis

The community help-seeking OASIS participants will differ from prison participants in terms of lower prevalence of Black ethnicity, social exclusion, childhood adversity and substance misuse.

9.2 Sample:

The community participants had sought help in the community and had been accepted onto the OASiS caseload. They subsequently agreed to participate in research and underwent the required assessments. The two groups had slightly different age ranges. The prison sample was aged 21-40 years, with a mean age of 27.5 (s.d. 5.8), while the community sample had an age range of 20-35 years, with a mean age of 26.1 (s.d. 4.3), which was not a significant difference (t=1.61, 84df, p=.11).

9.3 Mental Health

Of the 92 items from the PQ, 29 overlapped with items from the Modified PQ-B used in the prison (total items=33). Four of the follow up items in the Modified PQ-B designed to clarify the initial question were not in the longer version (See Appendix C: Items 8a, 14a, 18a, 21a).

Of the 29 items that both groups answered, the groups endorsed a similar number of items to each other (Table 29).

Table 29: PQ-B Scores

TOTAL SCORE ON ITEM Range 0-29	Prison (N = 44)	Community (N = 42)	P
Total number PQ items	14.7 (6.2)	12.5 (7)	.15

Table 30 shows the median CAARMS scores for each group. The literature tends to report CAARMS scores as means, using t-tests for comparisons. However, although the scale is validated and the scores here are normally distributed, it is strictly speaking an ordinal scale. For that reason, the median has been reported here with Mann-Whitney tests used for comparison of scores. Median scores from the remaining six subscales of the CAARMS were also compared across the groups. The community group scored higher on almost every item, for both severity and frequency, than the prison group. This reached significance levels on all items except for perceptual abnormalities. The only item on which the prison group had higher median scores was disorganised speech, in which the prison group scored significantly higher on severity. There was a significant difference between the groups on mania despite both groups having a median of 0. This was due to differing distributions of the CAARMS Scores in each group. The Mann-Whitney test is a non-parametric test that compares scores by ranking the data and seeing which group has the highest ranks. Both the community and prison group had a mode of 0 for both severity and frequency and duration, but the community group had a wider range of scores and participants scored at each level. Most participants in the prison group, in contrast, scored at the lower end, with a tiny minority at the upper end, and none in the middle. This meant that although the median for both scores was 0, the ranking of the median was significantly different between the two groups due to the distribution of scores, with the community groups having more higher rankings than the prison group.

Table 30: CAARMS Subscales Median Scores (Interquartile Range)

TOTAL SCORE ON ITEM	**Prison ARMS**	**Community ARMS**	**P**
Unusual Thought Content and Non Bizarre Ideas			
Severity	2 (1-4)	4 (3-5)	**.002**
Frequency and Duration	3 (2-4)	4 (3-5)	**.001**
Perceptual Abnormalities			
Severity	3 (1-4)	3 (2-4)	.37
Frequency and Duration	2.5 (1-4)	2 (1-3)	.98
Disorganised Speech			
Severity	2 (1-3)	1 (0-2)	**.02**
Frequency and Duration	3 (2-4)	2 (0-4)	.05
Mania			
Severity	0 (0-0)	0 (0-2)	**.002**
Frequency and Duration	0 (0-0)	0 0-3)	**.009**
Depression			
Severity	2 (0-3)	3 (0-4)	**.05**
Frequency and Duration	2 (0-4)	4 (0-5)	**.01**
Anxiety			
Severity	2 (0-3)	4 (3-4)	**.000**
Frequency	2 (0-4)	4 (3-4)	**.002**
Suicidality			
Severity	0 (0-2)	2 (0-3)	**.000**
Frequency	0 (0-1)	2 (0-3)	**.001**

9.4 Family Psychiatric History

Table 31 shows how the groups compare in terms of family psychiatric history. The groups did not differ in terms of a general family history of psychosis, although the community group did have a higher prevalence of psychosis in first degree family members, but this did not reach significance levels. The prison group had a higher rate of mental disorder other than psychosis in first degree family compared to the community group, but again this did not reach significance.

Table 31: Family Mental Health History

	Prison % (N)	Community % (N)	P
Family history psychosis	34 (15)	32 (10)	.87
1st degree fam hist psychosis	26 (6)	43 (9)	.19
1st degree fam history other	61 (14)	33 (7)	

9.5 Ethnicity

Our main measure was self ascribed ethnicity chosen from nine categories (Black British, Black African, Black Caribbean, White British, White Other, Asian Oriental, Asian Indian, Mixed, Other). These were then reduced down to three categories to aid analysis (see Table 32). There was a significantly higher prevalence of black participants in the prison group compared to the community group. Both Cramer's V (effect size in multiple X^2) and the Phi (2 x2) effect sizes show a moderate association between the variables (Cohen, 1992).Table 32: Ethnicity

	Prison % (N)	Community % (N)	Cramer's V	P
Ethnicity				
White	39 (17)	67 (28)		
Black	45 (20)	19 (8)	.30	**.02**
Other	16 (7)	14 (6)		
Ethnicity Binary			**Phi**	
White	39 (17)	67 (28)		
Non-white	61 (27)	33 (14)	.28	**.009**

9.6 Social Exclusion

Table 33 shows the items for social exclusion. The prison group were on all items the more socially excluded group. However, these differences did not reach significance level on either unemployment or recent homelessness. They were significantly more likely to be residing in short term accommodation compared to the community group. The prison group were also

more likely to have ended their educationa earlier and to have no qualifications. Using Cohen's (1992) guide, there is a moderate effect size for short term accommodation and large effect sizes for years of education and no qualifications.

Table 33: Social Exclusion

	Prison % (N)	**Community % (N)**	**Phi**	**P**
No qualifications	50 (22)	10 (4)	**.44**	**.000**
Unemployed	64 (28)	52 (22)	-.11	.29
Short term accommodation	46 (20)	20 (7)	**.27**	**.02**
Homeless before prison	18 (8)	11 (4)	.09	.41
	Mean (sd)		r	
Years of education	10.8 (2.9)	14.0 (2.5)	**0.51**	**.000**

9.7 Childhood Adverse Life Events

We had information to match on six items of childhood adverse events (Table 34). Information from the community group was unavailable on two items before the age of 17: witnessing family violence and being a victim of injury, illness or assault. Of the remaining items, the groups only differed on one: bullying. The reference category was the community group (coded 0) and the association was a weak one. The community group reported significantly higher rates of bullying before the age of 17 than the prison group. There was also no difference in the total number of events each group had experienced.

Table 34: Childhood Adverse Life Events Yes/No

	Prison % (N)	Community % (N)	Phi	P
Bullied	59 (26)	81 (33)	**-.23**	**.03**
Physical abuse	64 (28)	49 (18)	.15	.18
Separation	57 (25)	65 (24)	-.08	.46
In care	34 (15)	22 (8)	.14	.22
Sexual abuse	23 (10)	27 (10)	-.05	.65
Racial discrimination	34 (15)	27 (10)	.08	.49
At least one CAE	98 (43)	97 (36)	.01	.90
Cumulative O.R. (CI95%)	.99 (.717 – 1.357)		-	.93

9.8 Substance Misuse

Table 35 shows the lifetime substance use of the groups. Of nine substances, there was significantly higher prevalence of cannabis and crack use in the prison compared to the community group. It should be noted that this does not refer to heavy alcohol use rather just to lifetime use. The Prison group had used a mean of 4.6 substances (s.d. 2.5), compared to the Community group who had used 3.4 (s.d. 2.1), which was a significant difference: T=2.4 (81), p=.02. The relationship for use of crack was moderate, but for cannabis weak.

Table 35: Lifetime Substance Use

	Prison	**Community**	**Phi**	**P**
Alcohol	86 (38)	94 (32)	-.13	.26
Cannabis	93 (41)	78 (32)	**.22**	**.05**
Inhalants	16 (7)	6 (2)	.15	.18
Crack	48 (21)	18 (6)	**.31**	**.007**
Cocaine	64 (28)	54 (19)	.10	.40
Stimulants	57 (25)	56 (20)	.01	.91
Sedatives	32 (14)	21 (7)	.12	.30
Opiods	30 (13)	15 (5)	.17	.12
Hallucinogens	32 (14)	39 (13)	-.08	.49

Table 36 shows current substance use of the groups. As in the earlier chapters, we used the maximum weekly allowance for alcohol as recommended by the NHS of >3-4 units per day as a cut off point for alcohol abuse (www.nhs.uk/conditions/alcohol-misuse).

Table 36: Current use of substances

	Prison	Community	Phi	P
Alcohol >21	34 (15)	18 (6)	.18	.10
Cannabis	77 (34)	27 (9)	**.51**	**.000**
Crack	27 (12)	6 (2)	**.27**	**.02**
Cocaine	30 (13)	15 (5)	.17	.12
Stimulants	11 (5)	6 (2)	.09	.45
Any stimulant*	43 (19)	21 (7)	**.24**	**.04**
Sedatives	21 (9)	3 (1)	**.25**	**.03**
Opiods	14 (6)	6 (2)	.12	.28
Cumulative Current Use	**2.87 (1.649 – 4.983)*** **		**-**	**.000**

*either crack or cocaine or stimulants

Crack, cocaine and stimulants were combined to create a variable 'any stimulant' for participants who had recent use of any of the three drugs and this was found to be significant. Use of all substances are higher in the prison compared to the community group, significantly so for cannabis, crack and sedatives. When cumulative use of substances was examined (excluding the variable 'any stimulant'), the odds of being in the prison group almost trebled for every additional substance used compared to the community group. They were also more likely to rate their substance misuse as problematic scoring a mean of 7 (s.d. 4.6) on the Problematic Use Rating Scale compared to the community group who had a mean rating of 1.6 (s.d. 2.8), t (67df) = -5.4, p=.000. There were no differences in age at start of use of substances between groups except for hallucinogens in which the prison group had an earlier age of first use (Table 37).

Table 37: Substance Use: Age started

	Prison	Community	P
Alcohol	14 (5.2)	13 (3.4)	.23
Cannabis	15 (3.3)	15 (2.3)	.99
Crack	19 (3.8)	20 (5.6)	.39
Cocaine	18 (4.9)	19 (3.2)	.71
Stimulants	17 (3)	18 (2.5)	.23
Sedatives	21 (6.7)	19 (2.7)	.52
Opiods	21 (4.4)	18 (2.6)	.13
Hallucinogens	16 (2.9)	19 (2.7)	**.03**

Table 38 shows length of time current users have been using substances in years. The prison group had used cocaine, stimulants and hallucinogens for a significantly longer time than the community group. They had also used crack for substantially longer, although this not quite reach a statistical significant level. The overall picture is that while both groups have a similar lifetime use, the numbers of current users are dramatically decreased in the community group.

Table 38: Substance Use: Years of use of current users

	Prison Mean (sd)	Community Mean (sd)	P
Alcohol	13 (7)	13 (4.7)	.68
Cannabis	12 (5.7)	10 (4.7)	.12
Crack	10 (5.7)	5 (4.2)	.06
Cocaine	11 (5.5)	7 (4.5)	**.02**
Stimulants	12 (6.4)	8 (4.2)	**.02**
Sedatives	10 (9)	5 (5.3)	.25
Opiods	9 (7.4)	8 (6.7)	.80
Hallucinogens	16 (7.6)	6 (5.3)	**.001**

9.9 Discussion

This section compared a group of male prison participants with an ARMS who were identified via routine screening with a group of male community participants who had sought help either directly from the community service or via other healthcare agencies. The profile of ARMS is based on the work carried out with help seeking individuals in the community creating a selection bias (Fusar-Poli et al., 2013) that raises questions about how the profile would differ in other populations. There are particular issues that arise in the prison population that are not so salient in the community (high rates of personality disorder, high levels of distress on arriving in prison, high rates of substance misuse, impact of entering a perceived hostile environment, wide range of social problems). We hypothesised that the prison participants would have higher rates of i) black ethnicity ii) social exclusion iii) childhood adversity and iv) substance misuse. The analyses confirmed all these except for childhood adversity in which there was little difference between the groups except that the community group had experienced higher rates of bullying compared to the prison group.

The age range of the groups differed slightly, with the community participants being between 20 and 35 years and the prison group 21-40 years. However, analyses were run twice, once excluding those aged under 21 and over 35 years, the second time with all participants and there was no impact on results. The mean ages of the groups were higher than those usually reported in ARMS samples which tend to be between 20 and 24 years (e.g. French et al., 2012; Fusar-Poli et al. 2012b; Broom et al., 2005). However, this is to be expected as community groups tend to have to have a lower age limit of 14-16 years. Our prison group sample had a minimum age of 5-7 years older (21 years) than the typical community sample due to the type of prison and we sought to match the community sample to the prison sample as closely as possible, therefore excluding all participants aged less than 20 years. The groups did not differ in terms of number of items endorsed on the PQ. The screening questionnaire is aimed at

eliciting symptoms that have not been experienced under the influence of substances. However, in our prison sample this was not always possible, as some prisoners had had no drug free days in the month preceding reception. This meant that prisoners who had symptoms only while under the influence of substances or substance withdrawal were identified as such at the second stage assessment. The CAARMS was delayed in these prisoners to allow symptoms to subside. There was less heavy drug use in the community group, and this is possibly because those participants would have been screened out at an earlier stage. Anecdotal evidence also suggests that help seeking groups stop using substances as an early means of trying to control and manage their symptoms.

The CAARMS scoring revealed higher scores in the community group compared to the prison group on all but two of the scales on both severity and frequency and duration. The groups did not differ in experiences of perceptual abnormalities, but the prison group scored higher on disorganised speech. The literature on ARMS is based largely on help seeking populations. Biddle et al (2007) has speculated that the act of help seeking could be indicative of higher levels of distress and therefore be more unwell than those who do not seek help (Biddle et al., 2007). The higher ratings of anxiety, depression and suicidality among the community group support that idea. The higher ratings on the disorganised speech scale may reflect a lower level of education among the prison population. Disorganised speech by itself, unless having begun in the last two years and having a high score for both severity and frequency, is not sufficient for ARMS criteria. The prison group had been assessed with a later version of the CAARMS than was used in the community study. There were no differences in the number, content, phrasing or ways to score the questions between the two versions. Rather the earlier version had two scales (unusual thought and non-bizarre ideas) merged which were separated out in the later version. Separating the items out meant that the scoring could be broken down more and a better profile of the ARMS attenuated symptoms could be compiled.

Prevalence of Black ethnicity was higher in the prison compared to the community group. The high incidence of psychosis among Black populations has been the subject of investigation in the community for some years (Morgan et al., 2006). While prevalence rates in the community do not differ as markedly as incidence rates they nevertheless remain higher in Black groups. However, this is not the case in the prison population which shows lower prevalence of psychosis among Black groups than White (Coid et al., 2002a). Yet in-reach teams report an over representation of Black individuals on their caseloads (OHRN, 2009), suggesting an anomalous pathway. A comparison of demographics in the individuals who were psychotic identified in the prison population in the Singleton et al. study (1998) with those from the household population in the Meltzer et al. (2001) survey found a higher prevalence of Black and Minority Ethnic groups among the psychotic prisoner population compared to the community group (Coid et al., 2011). We hypothesised that perhaps there would be a higher rate of Black individuals with ARMS who are missed in the early stages of transition to psychosis and are identified much later when they are very unwell. Our hypothesis that Black ethnicity was associated with ARMS in the prison population was confirmed, indicating that this group may be vulnerable to being missed in the early days of developing psychosis. An important area for future research would be to follow up ARMS individuals with a view to ascertaining transition rates and what factors in prisoners are associated with transition.

The prison group was the more socially excluded group on all items, starting from school age, although the differences were not significant for all items. Some social exclusion items could be a consequence of crime involvement, for example, gaining employment is more difficult if an individual already has a criminal record. Other items clearly have temporal precedence. Only 4 out of 42 of the community group had no qualifications compared to half of the 44 in the prison group. The prison group had on average four years less education compared to the

community group. This finding is line with the criminology literature which shows a consistent link between lack of education and crime (Sabates and Feinstein, 2008; Lochner and Moretti, 2004). The difference in education also raises questions about the early life environment, issues around family, truancy, and bullying. The latter, though, was reported in higher levels in the community sample.

We had hypothesised that the prison group would have experienced higher levels of childhood adversity compared to the community group, but this was not the case. The only difference between the groups was a higher rate of bullying in the community compared to the prison group. There was also no difference in terms of period of time over which events had occurred. It may be that there is an under reporting of childhood adversity items in the prison population due to the environment in which the assessment is taking place. However, these findings confirm previous results of a comparison between a community and prison group of individuals with psychosis in which prevalence of childhood adverse events did not differ between the groups (Coid et al., 2011). The assessment used in the community was a more detailed one with many follow up questions to ascertain the exact nature of the abuse. Although we asked just two questions, participants often volunteered further detail about the nature of events. For example, we know that one prisoner had witnessed his father murder his mother when he was aged 6, that another had been stabbed when aged 10 by his father as he tried to protect his mother, that many had truanted from school due to being bullied, that some prisoners reported a level of physical abuse that had resulted in serious bodily injuries (including broken jaw, nose, ribs, arm, and even a fractured skull in one case). Some of the reported abuse in the prison group raises the question of whether although adverse events were more prevalent in the community group, they may have been more severe in the prison group. Perhaps seeking help in the community and being assessed in an NHS setting is also more conducive to revealing experiences of this nature.

The prison group had both higher lifetime and current use of substances, though these reached significance on few of the substances. Current use of cannabis and Class A drugs were substantially higher in the prison compared to the community population. They had also used more drugs cumulatively than the community group. The link between drug use and crime is well established with drugs playing a central role of re-offending in at least acquisitive crimes (UK Drug Policy Commission, 2008; Ministry of Justice, 2010). Lifetime use of drugs was similar between the groups, but current use was much lower in the community group suggesting drug use in this group was either experimental or they had stopped use earlier. Distress over symptoms may have motivated attempts to address the symptom causes leading to cessation of drugs. It may also be that the continued use of drugs is indicative of particular coping styles and that these lead to a different outcome i.e. prison. It is the repeated and ongoing use of cannabis which has been linked to the development of psychosis (Kuepper et al., 2011) so this finding may have implications for transition rates in the groups.

9.9.1 Strengths and Limitations

This was the first study as far as the authors are aware to carry out a comparison of different ARMS populations, on two levels: prison versus community; and help seeking versus non help seeking. The implications are important since a criticism within the ARMS literature is that the ARMS profile is based solely on help seeking populations and may therefore be an incomplete profile. The prison population were from the same geographical area as the community population prior to prison. The community sample were a group that not only had sought help and agreed to be accepted onto the community team's caseload but had also agreed to participate in research, suggesting that they are a particularly engaged group. The study was hindered by the small sample size in each group, limiting the analyses that could be carried out and also by the lack of matched detail on the questionnaires. The PQ questionnaire completed

by the community group had no distress ratings. This is important since it is the distress ratings that have emerged as more indicative of mental health issues in the prison group (see earlier chapters). We also did not collect information in the prison group on the details of early or current family life and support networks which may well be an important distinguishing factor between the two groups. We also did not have in depth information on the nature of early adverse life events in the prison group to compare with the community group. Prevalence of adverse life events differed between the groups but we do not know if they differed by severity. The questionnaires used in the community were more detailed than those used in the prison. Nevertheless, prison participants volunteered information at screen and were asked at CAARMS stage about their upbringing and we are confident that those describing adverse life events were not endorsing the items based on mild experiences, but were endorsing items that had resulted in harm. It may even be that the threshold for serious adverse events in childhood was higher in the prison if the severity was worse.

Participants were not assessed for personality disorder and this could be an important issue influencing the results. Previous research has confirmed a high rate of personality disorder among prisoners. Singleton et al. (1998) found an overall prevalence of personality disorder in 74% for male remand and 64% for male sentenced prisoners. The systematic review by Fazel and Danesh (2002) involving 23,000 prisoners found a prevalence rate of 65% for personality disorder. Community surveys have reported between 4.4% in a general population (Coid et al., 2006) and 24% in a primary care population (Moran et al., 2000). The issue is important since some prisoners have high rates of those personality disorders which can confuse the ultra high risk picture. Between 20 and 29% of male prisoners meet criteria for paranoid personality disorder and 14 to 23% meet criteria for borderline personality disorder (Singleton et al., 1998). Both disorders commonly feature transient psychotic level symptoms (Barnow et al.,

2010; Schroeder et al., 2012; Carroll, 2009), but neither is thought to be a particular risk factor for transition to psychosis (Nelson et al., 2013; Bernstein and Useda, 2007).

Chapter 10: Discussion and Conclusion

This chapter will discuss the overall findings of the study within the context of the literature, noting the strengths and limitations, before concluding the thesis.

10.1 Discussion

The aim of this study was to explore the possibility of introducing the OASIS service into the prison. The objectives were to determine prevalence of at risk mental state among prisoners, and to compare prisoners with an at risk mental state to those without and to a community help seeking group on a range of clinical and socio-demographic variables. As it was the first investigation in the prisoner population, the study was exploratory. We screened 891 prisoners over a period of 34 months and established a prevalence of 5% for ARMS and further 3% for first episode psychosis. Seven of the participants who were psychotic were identified at screening (within the first week of prison reception), the remainder were identified at the second stage assessment. Three of the participants who were found to be psychotic required immediate transfer to the inpatient wing due to their high risk to self. It was not possible to ascertain how many of the total psychotic group (N=25) were unwell before they came to prison and may therefore have been missed by reception screening, and how many made transition following reception. We were also able to establish that three of the participants with ARMS made transition to psychosis.

10.1.1 Screening

A substantial number of our participants who screened positive (44% of 891) met criteria for ARMS, psychosis or other current mental disorder. In addition to those meeting criteria for ARMS and psychosis, we also identified 16% of prisoners with other current mental health

problems and a further 10% with other lifetime mental health problems. The finding that so many prisoners with current mental disorder, including acute psychosis, were missed by routine reception screening is concerning but not surprising. Despite the acknowledged major mental health need among prisoners, reception staff are not mental health trained (Brooker and Ullman, 2008). Evidence on reception screening indicates it plays a useful role in detecting severe and enduring mental illness, but is less adequate in detecting lower level mental disorders (Brooker and Ullman, 2008). Our screening questionnaire proved a useful tool in detecting a broad range of mental disorder including disorders on the psychosis spectrum.

Current reception screening focuses on questions of received diagnosis and treatment (e.g. Birmingham et al., 1998; Gavin et al., 2003). The presence of individual symptoms is not explored. Prisoners with no previous service contact, who do not themselves report symptoms at reception, will be missed unless they present as obviously unwell in their appearance or behaviour. Once housed within the prison, the opportunity for them to receive help is dependent on them knowing how to seek help within the prison, wanting to seek help within this environment or if their behaviour raises enough concern for them to be referred by officers or other staff (Birmingham et al., 2001). Shaw et al (2003) have noted that successful screening requires 'privacy, reassurance of confidentiality, and help for those with literacy problems' (pp.146). Our experience on this study would very much endorse that opinion. The screening process also highlighted the importance of validating questionnaires in new populations.

The profile of the prison screen negative group was starkly different to any of the screen positive groups. The screen negative group can be conceptualised as a 'healthy control' group, one who did not view themselves as needing help for any mental health issue. They reported

lower levels of distress than the other groups. Another way to view this is to consider those who screened positive as a 'help accepting' group. Although they had not actively sought help, they did present with a range of issues and with levels of distress which they were willing to disclose and accept help for during the assessment process. Participants who screened positive had grown in up in hostile and chaotic environments, both in and out of the home, and appeared to have little current social support. Those who screened negative, in contrast, had experienced much lower levels of exposure to childhood adverse experiences, had more current social support, and lower levels substance misuse. Not surprisingly then, that their mental health profile was one of low levels of anxiety and depression, and much lower rates of self harm and attempted suicide compared to any of the screen positive groups. These findings support the notion of childhood adversity being an important influence in the development of mental disorder. They also give credence to the idea that individuals experiencing mental distress in prison are already experiencing distress prior to custody (Leibling, 2008). The role of the prison environment upon the psychological state of such individuals remains unclear.

10.1.2.At Risk Mental State

Understanding of the at risk mental state is currently based on information drawn from help seeking populations. These populations are drawn from a biased sample of individuals seeking and receiving help in specialised healthcare settings which have a research focus and where the source of referral varies widely but is largely opportunistic to the particular centre (Fusar-Poli et al., 2013). This study has helped to fill in the detail of the ultra high risk picture by comparing the profile of a help seeking group to one that is non help seeking, and also by comparing non help seeking individuals who screened positive for at risk mental state with those who screen positive for other mental health issues, as well as a comparison with those who screened negative.

The key difference between the false positive group and the at risk mental state group was the CAARMS scoring on the positive symptoms scales. These groups did not differ markedly in terms of social exclusion, childhood adversity or substance misuse. High risk patients in the community often have high rates of co-morbidity, in particular anxiety and depression, but also substance misuse (Fusar-Poli et al., 2012c). The emphasis on attenuated symptoms has therefore been criticised as misleading, as these co-morbid states could be indicative of other emerging mental health problems (Fusar Poli et al., 2013; Werbeloff et al., 2012). Furthermore, there has been a growing evidence that while attenuated symptoms may improve, functioning can remain at low levels (Addington et al., 2011; Fusar Poli et al., 2012b).

10.1.3. Prisoners versus Community Groups

The community help seeking group in this study had higher scores on almost all symptoms of the CAARMS, both positive and affective scales, confirming the idea that active help seeking is indicative of high distress levels (Biddle et al., 2007). The mean ages of both groups were higher than in typical community samples but this is most likely due to the higher minimum age of the prison group which was then matched by the community group, leading to the exclusion of participants in the lowest age ranges. While the prison group had higher levels of current drug use, both groups had similar levels of lifetime drug use. This suggests that the community group stopped using substances while the prison group continued. This fits with anecdotal reports from community participants who say they stop using substances in the hope that their symptoms will reduce and disappear. The continued use of drugs in the prison group may also be indicative of maladaptive coping styles which in the end lead to different pathways, one to prison, the other to services. In the community, it has been found that clients who are referred but fail to attend or engage with services do not differ from those who do in terms of symptoms, but rather functioning and, it has been speculated, higher levels of social support (Green et al., 2011). The prison group were the more socially excluded group,

suggesting that this is a population that have little social resources available to them and little know how in accessing formal social support.

10.2 Limitations

Although we had a good sample size in terms of participants, our ARMS sample was relatively small, constraining the analyses that could be carried out. We also unfortunately did not have the resources to carry out any follow up of participants. Thus we were not able to establish a transition rate for the sample. This could be particularly important in comparison to the community group if prison is a risk factor for transition. It is also important in determining whether participants' mental health changed so that would move up and down the continuum of the groups. The findings are merely a snap shot of a point in time when the assessments were carried out. We excluded participants who had an inadequate level of English to understand the assessment procedure. Entering a prison as a non English speaker encompasses various extra stressors which accumulate as a result of the inherent one of language (being unable to participate in activities, immigration issues, contact with family if the family do not reside in the UK). There was no formal inter-rater reliability carried out between the clinicians carrying out the CAARMS assessments. We collected virtually no information on current family situation (e.g. whether the participant lived alone, had a partner, children, whether they had anyone they could rely on etc). A lack of support network among prisoners is a key issue in coping both in and out of prison (Fazel et al., 2008; Konrad et al., 2007; Jenkins et al., 2005), this could be important information both from a risk factor point of view, but also in terms of engagement with services on release (Jarrett et al., 2011, Mills and Codd, 2008). Our measures of childhood adversity were somewhat basic, which was due to time limits for screening. So although we could compare prevalence between groups, it was more difficult to ascertain differences in severity. More detailed information may have revealed more key differences between groups. Also collecting this data at the second stage

of the process in the context of a semi structured interview may have yielded more information. We also did not collect data on personality disorder and this is an important issue bearing in mind the high rates of personality disorders among prisoners in particular the Cluster A disorders which commonly include transient psychotic symptoms.

The higher rate of substance misuse among both the prison compared to the community group and the prison group who met criteria for ARMS compared to the True Negative group may raise concerns that we have identified individuals experiencing symptoms while under the influence of substances. However, we took precautions of delaying the second assessment until such time as withdrawal symptoms could subside and our assessment addressed issues of substance use context. Our prevalence rate of 5% is relatively conservative in a population that a reported psychosis prevalence of between 4 -10% of (OHMRN, 2009; Singleton et al., 1998), suggesting that on the contrary we have been overly conservative in our interpretation of symptoms in the context of substance use.

10.2.1 Conceptual Limitations

The CAARMS has been criticised for being too focused on positive symptoms, with criteria for ARMS based on the positive symptoms scale. The recognition that negative and basic symptoms are important indicators of core components of psychosis has been further supported by recent studies showing these symptom clusters as being linked to transition (Demjaha et al., 2012; Valmaggia et al., 2013). Our assessment, in line with that used in the community, defined at risk mental state criteria based on the positive symptom scales.

The non-specific nature of prodrome has been discussed a length in the literature (Davidson, 2001, Malla and Norma, 1994, Keith and Matthews, 1991), as has the difficulties in translating

this to the detection of the At Risk Mental State (Falloon, 1992, Malla and Norman, 1994). Since even the validity of what constitutes the threshold for psychosis is heavily debated (Allardyce et al., 2007, Bentall, 2006, Maj, 1998), the validity of what constitutes the lower level of high risk for psychosis is necessarily open to debate. The concept of the at risk mental state is constantly evolving as the early detection research reveals transition rates which have decreased since the initial work in the 1990s and complex profiles of a broad range of mental disorder. While this piece of work has contributed to the overall picture by providing a profile of non help seeking sample, it should also be noted that this profile cannot be generalised to other non help seeking populations. The high false positive results from the screening demonstrated that while prisoners endorse many items, they are often non pathological and non psychotic reasons for their experiences. A careful and conservative approach to the comprehensive assessment is a strength in this population so that individuals who are having either transient or non psychotic like experiences are not identified as being at risk for psychosis.

10.3 Strengths

This was the first study examining ARMS in a prison setting. We were also the first study to examine ARMS in a non-help seeking population. We established prevalence of ARMS and we also identified prisoners with first episode psychosis who we were able to refer to the outreach services. We were able to signpost participants to other services in the prison and to contribute to safer custody by identifying prisoners who are at risk of self harm and/or suicide. We also established that the screening questionnaire identifies people that want help even if they have not actively sought help. Participants had the opportunity to opt out of contact with the mental health research/services at various stages by i) refusing to take part ii) denying symptoms iii) denying distress iv) refusing to undergo the CAARMS v) refusing information or referral to other services vi) refusing to engage with services who had received the referral.

However, we had a low number of refusals both for screening and for CAARMS. We established from carrying out CAARMS with participants who screened negative that they did not present as hiding mental health symptoms or distress. We only made referrals to services with the individual's permission, and with a couple of notable exceptions, all individuals engaged with mental health services in the prison. This is indicative of a need and willingness to receive help despite not having actively sought help. Our prevalence rate of 5% ARMS suggests that our approach was not overly inclusive and as mentioned above perhaps erred on the side of caution in terms of assigning diagnosis. This though can be viewed as a strength. Where the at risk mental state is being identified via blanket screening, in a population with high levels of substance misuse; low levels of education and therefore inability to identify and describe in detail feelings and symptoms; where a decline in functioning may be due to the custodial environment (either not knowing the process to access activities or feeling so anxious that participation in activities is not sought); where cultural understanding of unusual phenomena is usual; it is right that the decision to define an individual's experiences and distress as being due to risk of psychosis should be taken with care.

10.4 Update

The aim of the overall project was to establish feasibility of introducing an early detection of psychosis service in a prison setting. The study has led to the introduction of such a service in the prison were the study was based, and also in a Young Offender Institution (holding males aged 18-25 years). As far as the authors are aware it is the first service of its kind in the world. The service is also unique in that prisoners taken on the caseload will continue to see the same psychologist in the community as in prison when they are released. On the whole, this has resulted in good engagement with prisoners following their re-incorporation into the community. The screening questionnaire needs to undergo further development with a view

to shortening it to 10-15 items from the current 33 which is too time consuming for routine screening. This is in progress.

Since the service was introduced the role of the prison has changed from a Category B local prison to a Category C resettlement prison. Under this reconfiguration, the new intake criteria for prisoners entering the prison changed so that they should have i) no serious physical or mental health problems which required hospitalisation in the last six months ii) have completed detoxification regimes iii) be serving a 1-2 year sentence iv) be from any of the London boroughs. The initial impact on the service of the reconfiguration has been an overall reduction in the number of prisoners from the SLaM boroughs, although this varies from week to week; and a reduction in the proportion of people who rate positive at the initial screening (44% to 24%). This may be due to the fact that we have also incorporated the new cut off criteria identified in Chapter 7, since the proportion of prisoners who meet criteria for ARMS remains the same as before (5%) as does the proportion who meet criteria for psychosis (3%). However, it remains too early to tell how the re-role of the prison will impact on the service in the long term.

10.5 Implications

This section addresses some of the implications of the study. There are areas of further research which have been identified. The legal implications of an at risk mental state are unclear as yet, but may well form part of future court cases. There are also implications for further development both in the community and in prison settings with the awareness that good mental health screening and assessment could lead to early detection and treatment of a range of mental disorder, not just psychosis.

10.5.1 Further Research

This study has highlighted some gaps for research with a view to further service development. Longitudinal research is necessary to examine the notion of imported vulnerability on the mental health of prisoners. A comprehensive assessment of prisoners' mental health on reception with follow up evaluations over a period of months or even years would help to distinguish how prisoners with poor mental health differ from those who appear more resilient over their time in custody. It would also allow for information on transition rates to be captured. The findings from this study indicate that a chaotic family and social support network can result in a range of problems which include ending up in prison. The role of substance use as a means of coping with unstable family background and poor social support may lead to differing life pathways. Viewed in this way it is not surprising that that there are high rates of mental disorder among prisoners.

It was not possible to carry out a power calculation a priori to this study since there was no viable data on which to base the calculation. A retrospective power calculation would risk an inflated probability of power which would be misleading when designing future studies. However, we have calculated effect sizes and along with the other findings, these results can inform further research for at risk mental state work in prison settings.

Placing prisoners who are experiencing their first episode of psychosis on the prison inpatient wing is a highly distressing experience for them. As there is only one inpatient wing in a prison, the wings hold a mixture of individuals facing a range of problems which is not generally conducive to a calm and safe atmosphere. The role of inpatient wings in prisons is unclear and therefore ways of improving them have not been proposed and this is clearly an area which

needs to be addressed. Any early detection and intervention work would have to include an examination of the current care pathway and alternative intervention options.

There is also little understanding of the risks and benefits of seeking help for mental health problems in a prison setting. If a prisoner discloses that they have psychotic symptoms, they will benefit from having extra support from in-reach team staff, but they also run the risk of being moved to the inpatient wing, and then transferred to hospital under section. From the staff point of view, this may be a benefit but clinical experience suggests prisoners rarely agree with this view.

Further areas for research included developing interventions for this environment and for this population. Cognitive Behavioural Therapy for example requires a minimum level of education and motivation on the part of the client. Many prisoners have low levels of education, and may be facing various problems in prison or on impending release which will impact on their motivation. In addition, there are limited opportunities to carry out the homework required for such therapies in prison.

10.5.2 Implications for the legal process

Mental disorder can constitute a mitigating factor and have relevance at the time of the decision to prosecute or divert from criminal justice system, in fitness to plead and in the sentencing and disposal of the accused (www.cps.gov.uk/legal). Criminal acts consist of two basic elements: actus reus and mens rea. The former refers to the commission of a guilty act as well as an omission, the failure to act. Robbing a bank would be an example of the first, a parent failing to obtain medical attention for a very sick child would be an example of the second. In addition to the criminal act or omission there is the mental element or intention.

This is known as the mens rea (guilty mind). The term encompasses the general culpability and has different thresholds. The distinction between murder and manslaughter for example is the mens rea. In the first, the highest threshold of intention is required, while in the second, even with a serious act of violence, if the intention was not to kill, the threshold for culpability is lowered (Littmann, 1994). Mens rea is not to be confused with motive. If two people rob a bank, one to give the money to a homeless person and one to buy drugs, the intent remains the same, to take the money illegally from the bank (Littmann, 1994). Their mens rea are equivalent. The law presumes that adult individuals are sane and accountable for their actions and the onus is therefore on the defence to establish the contrary. If at the time of the crime a person was sufficiently impaired by their symptoms, even if they are attenuated symptoms, they would not have the ability to form the necessary mens rea and this may therefore potentially impact on the offender's threshold for mens rea and therefore serve as a mitigating factor at the time of prosecution or sentencing. The implications are that the at risk mental state could form part of a defence in particular crimes.

10.5.3 Evolution of Early Detection Services

A major criticism of ARMS services is the danger of labelling individuals as being at risk of psychosis, causing distress to them and possibly resulting in making them feel stigmatised, when the actual risk of transition is quite low. However, while the stigma associated with mental illness and in particular psychosis are well documented (Rose et al., 2007; Thornicroft et al., 2009; Evans-Lacko et al., 2013), the solutions to the problem to date have not involved either doing away with diagnoses or not making services available. Many have argued for the current diagnostic system to be revised due to its lack of validity (Allardyce et al., 2007; Bentall, 2006; Boyle, 2002) but there is no sign of a viable alternative system being developed in the foreseeable future. The ARMS diagnosis has been debated as one of the key and most controversial additions to the new DSM-V manual. Arguments in favour are promoting access

to services for people in distress, the higher risk of psychosis than the general population, and earlier intervention and improved prognosis for those in whom prevention of psychosis is not possible (Fusar-Poli and Yung, 2012). Arguments against are the high number of false positives, unnecessary labelling with the associated stigma, unnecessary treatment with anti-psychotic medication, and also the danger of diagnostic creep (Fusar-Poli and Yung, 2012). The issue however is complex. In the United States, access to healthcare tends to be financed by insurance and the companies only pay for disorders formally recognised and defined in the DSM manuals. Frances (2010) has noted that new diagnoses raise two areas of serious concern. One is the lowering of diagnostic thresholds and the second is the potential exploitation by the pharmaceutical industry. She includes the high risk syndrome as being 'one of the 19 worst ideas for DSM-V'. She also notes that that there has been little thought as to how new diagnoses can be subject to misuse in forensic settings. McGorry (2010) has argued in favour of an approach that focuses less on diagnosis and more on symptoms and accompanying distress. In this way, services could aim to identify and intervene in those who want help with a view to preventing development of mental disorder rather than just psychosis. In the UK this would involve a radical re-organisation of services which are currently set up to measure outcomes for management and treatment of particular disorders.

10.6 Organisation and development of services in prison settings

The principle of *equivalence of care* (Her Majesty's Inspectorate of Prisons, 1996) came about as a response to the recognized need for improvement in prison healthcare provision. However, the notion that equivalence of care should be understood or implemented as a mirror of community services belies the reality of the prison environment. Mental health services within the NHS currently have a wide array of services which are specific to the diagnosis and needs of the service user (Thornicroft and Tansella, 2004). The prison environment does not ultimately lend itself to the same organization of services with such

narrow diagnostic criteria. The sheer logistics of incorporating such a wide range of healthcare staff in a prison setting each with a particular agenda for assessment and treatment in an environment with a high population turnover, high levels of co-morbidity, and an inability to ensure continuity of care in other prisons across the country in the event of transfer raises serious questions of both feasibility and cost effectiveness. Forrester et al. (2013) have argued the scale and complexity of mental health needs of those coming into the criminal justice system calls for a response that is 'strategic and incorporates long term service planning aims' (pp.327). Prisons offer an opportunity for a 'one-stop-shop' approach to physical and mental healthcare and emergent thinking is that this can be best achieved through delivering services that cut through traditional primary and secondary care divisions, along the lines of a poly-clinic model.

10.7 Conclusion

Overall, our results support the need for an early detection/intervention service in prisons. The study also shows that effective screening can lead to the previously unidentified range of mental disorders in this setting which can contribute to triage, reducing distress and a safer custody environment. McGorry (2010) has questioned whether it is acceptable to deny individuals who are persistently distressed or impaired access to services on the basis that these may be common experiences, or even because of stigma. He has already mooted the idea that the at risk mental state approach should not be focused solely on the psychosis risk, but rather on the full range of potentially serious mental health disorders. Within a prison setting this is possibly a more productive approach, not just in terms of meeting needs of prisoners but also terms of being more logistically feasible and adapting a service to the custodial environment.

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Appendix A

Version 2, date 15/12/2008

South London and Maudsley NHS
NHS Foundation Trust

Institute of Psychiatry
at The Maudsley

KING'S College LONDON
Founded 1829
University of London

(**Protocol Number**:08/H0302/118)

Information Sheet for Participants

Title of Study

The risk of mental health problems among prisoners in HMP Brixton.

We would like to invite you to participate in this original research study.

This a feasibility study and aims to find out how many people in Brixton Prison are at risk of developing mental health problems.

You should only participate if you want to; choosing not to take part will not disadvantage you in any way.

Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve.

Please take time to read the following information carefully and discuss it with others if you wish.

Purpose of the study

The purpose of this feasibility study is to find out how if it is possible to identify people to who are at risk of developing mental health problems. The results of this study will help setting-up services in prison to offer help to people who need it as soon as possible.

Why have I been invited to take part?

We are approaching all people who have just been received into prison from court who are resident in the South London and Maudsley Foundation Trust area (Southwark, Lambeth, Croydon and Lewisham) and asking them to take part.

Do I have to take part?

It is up to you to decide whether or not to take part.

If you do decide to take part:

- you are still free to withdraw at any time, without giving a reason.
- your decision will not affect the standard of care you receive from the prison or from any medical services at any time.

What will happen if I take part?

- you will be given this information sheet to keep
- you will be asked to sign a consent form
- You will be asked some questions about who you are (age, ethnicity), your mental state, your previous and recent use of alcohol and other substances, as well as some questions about serious negative experiences you may have had in the past. This interview will take approximately 30 minutes.
- Following this initial screening, you may be asked to take part in more in-depth interview with Dr Winton-Brown, psychiatrist. This second interview will take a maximum of 2 hours.
- If appropriate, you will be given the contact details of the Outreach and Support in South London Service which may be able to offer you treatment when you leave the prison.

If I agree to take part what happens to the information?

All the information we obtain from you and your medical records is confidential and used for the purpose of the study only. The information will be used in a way that will not allow you to be identified individually.

The information collected during the study will be stored in a computer but your name will not be linked to it in any way.

Is there any risk involved in taking part?

There are no anticipated risks to you or to others. However, if you feel the study has harmed you in any way or if you feel you have any further questions, tell your personal officer who will then contact the research team and we will come back and see you.

If during the course of this study we obtain information that indicates that you may be at risk of harming yourself or that you may be experiencing a distressing mental health problem we will discuss this with you first and we will let the prison mental health team know about it so that they can offer you the appropriate help.

What will happen to the results of the research study?

The results of the study will inform the roll-out of the early detection and early intervention service to a prison population. After publication, copies of the published results will be available to you on request.

Who is organising and funding the research?

The study has been funded by the Guy's and St Thomas' Charitable Foundation.

Who has reviewed the study?

An ethics committee has reviewed the study for compliance with medical and ethical standards and for scientific value.

Contact for further information

Whenever you want to get more information on this study, please contact:

Brixton Prison Mental Health Outreach Team, extension 6016. The office is staffed 9am until 5pm and they will pass your queries on to Manuela Jarrett or Toby Winton-Brown who will be happy to contact you to provide more information.

Who should I contact if I wish to complain about the study?

Every prison wing has a locked complaints box, the keys of which are kept in the main complaints office of the prison. If you want to complain about the study you can do so by filling in a complaints form and put it in the complaints box. Someone from the complaints office collects the envelopes and prisoners receive an acknowledgement within 7 days. The aim is to investigate the complaint as promptly as possible.

Thank you for considering taking part in this study. You will be given a copy of the information sheet to keep.

South London and Maudsley NHS
NHS Foundation Trust

Institute of Psychiatry
at The Maudsley

KING'S College LONDON
Founded 1829
University of London

The risk of mental health problems among prisoners in HMP Brixton

Consent form

Name: _____ ID number: _____

1. I confirm that I have read and understood the attached information sheet and have had the opportunity to ask questions. ☐

   OR

   I confirm that I have had the attached information sheet explained to me and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I can withdraw from the study at any time without having to give any reason, and without my medical care or legal rights being affected. ☐

3. I consent to my medical records being looked at by a member of the research team. ☐

4. I agree to take part in this research project. ☐

_____ _____

Signature of Participant Date

_____ _____

Signature of Researcher Date

Appendix B

Socio-Demographic Information

Age _____

Gender Male / Female

Ethnicity
[ ] Black British
[ ] Black African
[ ] Black Caribbean
[ ] White British
[ ] White Other please specify _____
[ ] Asian Oriental
[ ] Asian Indian
[ ] Middle-East Arab
[ ] Mixed
[ ] Other please specify _____

Country of birth:

Employment (before coming to prison):
[ ] student
[ ] part-time PAID employment
[ ] full-time PAID employment
[ ] part-time UNPAID employment
[ ] full-time UNPAID employment
[ ] unemployed

Accommodation (before coming to prison)::
[ ] I was living alone
[ ] I live with my parents
[ ] I own the house/flat where I'm living
[ ] I'm renting a house/flat
[ ] I'm renting a bed-sit
[ ] I'm renting a room in a house share
[ ] I'm staying in a hostel
[ ] I'm homeless

Years of education Highest level achieved

Mother's occupation Year of mother's birth Country of mother's birth

Father's occupation Year of father's birth Country of father's birth

Past family history of mental health problems :[ ] Yes [ ] No

Who and What:

Trauma inventory

While growing up: Have you been bullied?

[ ] No [ ] Yes From the age of _____ till the age of _____

When you were a child or teenager were you ever hit repeatedly with an implement (such as a belt or stick) or punched, kicked or burnt by someone in the household?

[ ] No [ ] Yes From the age of _____ till the age of _____

While growing up: did you see or hear family violence?

[ ] No [ ] Yes From the age of _____ till the age of _____

While growing up: Have you ever been separated from your parent for one year or more?

[ ] No [ ] Yes From the age of _____ till the age of _____

While growing up: Were you ever in a children's home or institution:

[ ] No [ ] Yes From the age of _____ till the age of _____

When you were a child or teenager did you ever have any unwanted sexual experiences?

[ ] No [ ] Yes From the age of _____ till the age of _____

Have you ever suffer from a serious illness, injury or an assault?

[ ] No [ ] Yes When?

Have you ever discriminated against because of your ethnicity?

[ ] No [ ] Yes When?

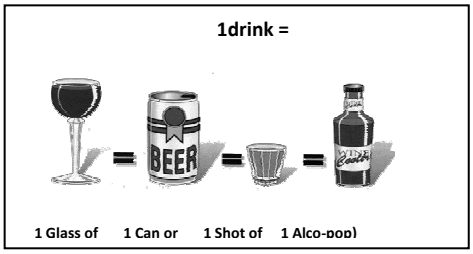
OASIS Substance Use Scale -

1. Do you drink alcohol? [ ] No [ ] Yes

2. How old were you when you first had a drink of alcohol? _____ years.

3. How many drinks containing alcohol do you have on a typical day when you are drinking?

[ ]. None
[ ] 1 or 2
[ ] 3 or 4
[ ] 5 or 6
[ ] 7 to 9
[ ] 10 or more



4. How often do you usually drink?

[ ] Never
[ ] Less than monthly
[ ] Once a month
[ ] 2 or 3 times a month
[ ] Weekly
[ ] Daily or almost daily

5. How often do you have **five (four if you are <u>female</u>) or more drinks** on one occasion?

[ ] Never
[ ] Less than monthly
[ ] Monthly
[ ] Weekly
[ ] Daily or almost daily

6. "During the last year…"

a.	**Did you think your alcohol or other drug use was out of control?**			
	Never (0)	Sometimes (1)	Often (2)	Always (3)
b.	**Did the thought of not being able to get any alcohol or other drug(s) make you anxious or worried?**			
	Never (0)	Sometimes (1)	Often (2)	Always (3)
c.	**Did you worry about your alcohol or other drug use?**			
	Never (0)	Sometimes (1)	Often (2)	Always (3)
d.	**Did you wish you could stop?**			
	Never (0)	Sometimes (1)	Often (2)	Always (3)
e.	**How difficult would you find it to stop or go without?**			
	Easy (0)	Fairly difficult (1)	Very difficult (2)	Almost Impossible (3)

	Have you **ever** used it?	How old were you when you used it the **first time**?	When was the **last time** you used it?	How often have you used it in the **last month**?	How much have you used?
Cigarettes	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	Number of cigarettes:
Marijuana, weed	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	Number of joints:
Skunk	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	Number of joints:
Inhalants (glue, petrol, gas etc)	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Crack	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Cocaine	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Amphetamines / Stimulants inc. ecstasy	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Sedatives (sleeping pills, valium)	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Opioids (heroin, morphine, methadone)	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Hallucinogens (LSD, mushrooms, PCP)	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?
Other substances? What?	YES			[ ] Never [ ] Once a month [ ] 2 or 3 times a month [ ] Weekly [ ] Daily or almost daily	How much?

Supplement SPE

How anxious have you felt in the last month?

I----------I

0 10

Not anxious Extremely

at all anxious

How depressed have you felt in the last month?

I----------I

0 10

Not depressed Extremely

at all depressed

Have you ever self harmed? No Yes Please describe: _____

Have you ever tried to end your life? No Yes When? _____

CJS data

Prison Number _____

Legal Status:

Remand
Sentenced
Unsentenced
Licence Recall Original Offence: _____

Offence:

1. Murder 2.Sexual Offences 3.Robbery
4.Attempted Murder 5.Grevious Bodily Harm 6.Actual Bodily Harm
7.Burglary 8.Fraud, Forgery 9.Criminal Damage
10.Theft, handling stolen goods 11.Drug Offences 12.Driving Offences
13.Common Assault 14. Possession of Offensive Weapon 15.
16. Other offence (specify) _____

First time in prison? Yes No

Upbringing

Family background:

Childhood/Schooling:

Medical/Psychological History Personal and Family:

CJS:

First contact law

First prison sentence

Longest sentence

Substance Misuse

Alcohol:

Cannabis:

Class A:

Functioning

Outside prison:

Inside prison:

How do you cope in prison?

How do you pass the time during bang up time?

How do you get on with your cell mate?

And other prisoners?

Other

1: POSITIVE SYMPTOMS

1.1 UNUSUAL THOUGHT CONTENT

Delusional Mood and Perplexity ('Non Crystallized Ideas')

- Have you had the feeling that something odd is going on that you can't explain? What is it like?
- Do you feel puzzled by anything? Do familiar surroundings feel strange?
- Do you feel that you have changed in some way?
- Do you feel that others, or the world, have changed in some way?

Ideas of Reference

- Ideas of Reference: Have you felt that things that were happening around you had a special meaning, or that people were trying to give you messages? What is it like? How did it start?

Bizarre Ideas ('Crystallized Ideas')

- *Made thoughts, feelings, impulses: Have you felt that someone, or something, outside yourself has been controlling your thoughts, feelings, actions or urges? Have you had feelings or impulses that don't seem to come from yourself?*
- Somatic Passivity: Do you get any strange sensations in your body? Do you know what causes them? Could it be due to other people or forces outside yourself?
- *Thought Insertion: Have you felt that ideas or thoughts that are not your own have been put into your head? How do you know they are not your own? Where do they come from?*
- *Thought Withdrawal: Have you ever felt that ideas or thoughts are being taken out of your head? How does that happen?*
- *Thought Broadcasting: Are your thoughts broadcast so that other people know what you are thinking?*
- *Thoughts Being Read: Can other people read your mind?*

UNUSUAL THOUGHT CONTENT- GLOBAL RATING SCALE

0 **Never, absent**	1 **Questionable**	2 **Mild**	3 **Moderate**	4 **Moderately severe**	5 **Severe**	6 **Psychotic and Severe**
No unusual thought content.	Mild elaboration of conventional beliefs as held by a proportion of the population	Vague sense that something is different, or not quite right with the world, a sense that things have changed but not able to be clearly articulated. Subject not concerned/ worried about this experience.	A feeling of perplexity. A stronger sense of uncertainty regarding thoughts than 2.	Referential ideas that certain events, objects or people have a particular and unusual significance. Feeling that experience may be coming from outside the self. Belief not held with conviction, subject able to question. Does not result in change in behaviour.	Unusual thoughts that contain completely original and highly improbable material. Subject can doubt (not held with delusional conviction), or which the subject does not believe all the time. May result in some change in behaviour, but minor.	Unusual thoughts containing original and highly improbable material held with delusional conviction (no doubt). May have marked impact on behaviour.

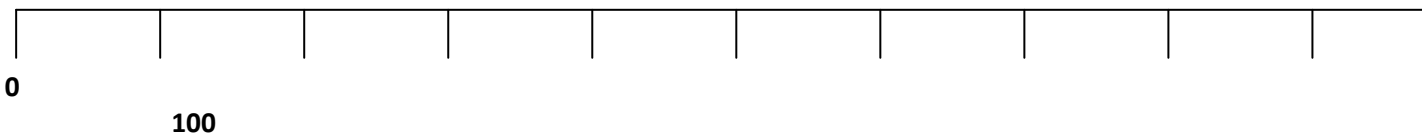
Onset date: _____ Offset date: _____ Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week – **less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. OR several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use noted	Occurs in relation to substance use and at other times as well	Noted only in relation to substance use

Level of Distress (In Relation to Symptoms)



0 **100**

1.2 NON-BIZARRE IDEAS

Non-Bizarre Ideas ('Crystallized Ideas')

- Suspiciousness, Persecutory Ideas: Has anybody been giving you a hard time or trying to hurt you? Do you feel like people have been talking about you, laughing at you, or watching you? What is it like? How do you know this?
- Grandiose Ideas: Have you been feeling that you are especially important in some way, or that you have powers to do things that other people can't do?
- Somatic Ideas: Have you had the feeling that something odd is going on with your body that you can't explain? What is it like? Do you feel that your body has changed in some way, or that there is a problem with your body shape?
- Ideas of Guilt: Do you feel you deserve punishment for anything you have done wrong?
- Nihilistic Ideas: Have you ever felt that you, or a part of you, did not exist, or was dead? Do you ever feel that the world does not exist?
- Jealous Ideas: Are you a jealous person? Do you worry about relationships that your spouse/girlfriend/boyfriend has with other people?
- Religious Ideas: Are you very religious? Have you had any religious experiences?
- Erotomanic Ideas: Is anyone in love with you? Who? How do you know this? Do you return his/her feelings?

NON-BIZARRE IDEAS - GLOBAL RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Psychotic and Severe
No non-bizarre ideas.	Subtle changes that could be reality based. Eg. Very self-conscious.	Increased self-consciousness. Eg. Feeling that others look at the subject, or talk about the subject. Or feeling of increased self-importance. Subject able to question.	Odd or unusual thoughts but whose content is not entirely implausible- may be some logical evidence. More evidence than rating of 4. Content of thoughts not original i.e. jealousy, mild paranoia.	Clearly idiosyncratic beliefs, which although 'possible' have arisen without logical evidence. Less evidence than rating of 3. Eg. Thoughts that others wish the subject harm, which can be easily dismissed. Thoughts of having special powers, which can be easily dismissed.	Unusual thoughts about which there is some doubt (not held with delusional conviction), or which the subject does not believe all the time. May result in some change in behaviour, but minor.	Unusual thoughts containing original and highly improbable material held with delusional conviction (no doubt). May have marked impact on behaviour.

Onset date: _____ ***Offset date*:** _____

Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. OR several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use/stress noted	Occurs in relation to substance use and at other times as well	Noted only in relation to substance use

Level of Distress (In Relation to Symptoms)

Visual Changes

- Distortions, illusions: Is there a change in the way things look to you? Do things somehow look different, or abnormal? Are there alterations in colour, or brightness of objects (things seeming brighter, or duller in colour)? Are there alterations in the size and shape of objects? Do things seem to be moving?
- Hallucinations: Do you have visions, or see things that may not really be there? Do you ever see things that others can't, or don't seem to? What do you see? At the time that you see these things, how real do they seem? Do you realise they are not real at the time, or only later?

Auditory Changes

- Distortions, illusions: Is there any change in the way things sound to you? Do things somehow sound different, or abnormal? Does your hearing seem more acute, or have increased sensitivity? Does your hearing seem muted, or less acute?
- Hallucinations: Do you ever hear things that may not really be there? Do you ever hear things that other people seem not to (such as sounds or voices)? What do you hear? At the time you hear these things, how real do they seem? Do you realise they are not real at the time, or only later?

Olfactory Changes

- *Distortions, illusions: Does your sense of smell seem to be different, such as more, or less intense, than usual?*
- *Hallucinations: Do you ever smell things that other people don't notice? At the time, do these smells seem real? Do you realise they are not real at the time, or only later?*

Gustatory Changes

Distortions, illusions: Does your sense of taste seem to be different, such as more, or less intense, than usual?
Hallucinations: Do you ever get any odd tastes in your mouth? At the time that you taste these things, how real do they seem? Do you realise they are not real at the time, or only later?

Tactile Changes

- *Distortions, illusions, hallucinations: Do you ever get strange feelings on, or just beneath, your skin? At the time that you feel these things, how real do they seem? Do you realise they are not real at the time, or only later?*

Somatic Changes

NOTE: Probes also used to rate Impaired Bodily Sensation, p.26
Distortions, illusions: Do you ever get strange feelings in your body (eg feel that parts of your body have changed in some way, or that things are working differently)? Do you feel/think that there is a problem with some part, or all of your body, i.e. that it looks different to others, or is different in some way? How real does this seem?
Hallucinations: Have you noticed any change in your bodily sensations, such as increased, or reduced intensity? Or unusual bodily sensations such as pulling feelings, aches, burning, numbness, vibrations?

PERCEPTUAL ABNORMALITIES - GLOBAL RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Psychotic but not severe	6 Psychotic and severe
No abnormal perceptual experience.		Heightened, or dulled perceptions, distortions, illusions (eg lights/ shadows). Not particularly distressing. Hypnogogic/ hypnopompic experiences	More puzzling experiences: more intense/vivid distortions/ illusions, indistinct murmuring, etc. Subject unsure of nature of experiences. Able to dismiss. Not distressing. Derealisation/ depersonalis[n]	Much clearer experiences than 3 such as name being called, hearing phone ringing etc, but may be fleeting/ transient. Able to give plausible explanation for experience. May be associated with mild distress.	True hallucinations i.e. hearing voices or conversation, feeling something touching body. Subject able to question experience with effort. May be frightening or associated with some distress.	True hallucinations which the subject believes are true at the time of, and after, experiencing them. May be very distressing

Onset date: _____ ***Offset date*****:** _____

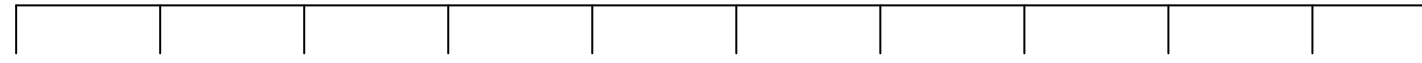
Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week **– more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily **– less** than an hour per occ.	Daily **– more** than an hour per occ. OR several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use noted	Occurs in relation to substance use and at other times as well	Noted only in relation to substance use

Level of Distress (In Relation to Symptoms)



0 **100**

1.4 DISORGANISED SPEECH

NOTE: Probes also used to rate Alogia, p. 16

Subjective Change:

- Do you notice any difficulties with your speech, or ability to communicate with others?
- Do you have trouble finding the correct word at the appropriate time?
- Do you ever use words that are not quite right, or totally irrelevant?
- Have you found yourself going off on tangents when speaking and never getting to the point? Is this a recent change?
- Are you aware that you are talking about irrelevant things, or going off the track?
- *Do other people ever seem to have difficulty in understanding what you are trying to say/trouble getting your message across?*
- *Do you ever find yourself repeating the words of others?*
- *Do you ever have to use gesture or mime to communicate due to trouble getting your message across? How bad is this?*
- *Does it ever make you want to stay silent and not say anything?*

Objective Rating of Disorganised Speech

- *Is it difficult to follow what the subject is saying at times due to using incorrect words, being circumstantial or tangential?*
- *Is the subject vague, overly abstract or concrete? Can responses be condensed?*
- *Do they go off the subject often and get lost in their words? Do they appear to have difficulty finding the right words?*
- *Do they repeat words that you have used or adopt strange words (or 'non-words') in the course of regular conversation?*

DISORGANISED SPEECH- GLOBAL RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Psychotic
Normal logical speech, no disorganisation, no problems communicating or being understood.		Slight subjective difficulties eg problems getting message across. Not noticeable by others.	Somewhat vague, some evidence of circumstantiality, or irrelevance in speech. Feeling of not being understood.	Clear evidence of mild disconnected speech and thought patterns. Links between ideas rather tangential. Increased feeling of frustration in conversation.	Marked circumstantiality, or tangentiality in speech, but responds to structuring in interview. May have to resort to gesture, or mime to communicate.	Lack of coherence, unintelligible speech, significant difficulty following line of thought. Loose associations in speech.

Onset date: _____ ***Offset date*****:** _____

Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. *OR* several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use noted	Occurs in relation to substance use and at other times as well	Noted only in relation to substance use

Level of Distress (In Relation to Symptoms)

100									

7: GENERAL PSYCHOPATHOLOGY

7.1 MANIA

NOTE: See also Dangerous Behaviour/Aggression, p. 23

- Would you describe your mood as 'high', or 'hyper' recently?
- Have you been feeling excessively cheerful and had more energy than usual? How long has this feeling lasted?
- Have you felt out of control at these times?
- Has this feeling been in response to a substance, or event that has occurred (i.e. finished exams, new boyfriend/girlfriend etc)?
- Have you been able to stay awake doing things for longer periods of time than usual?
- Have you been sleeping less than usual?
- Have you found yourself spending more money than usual, or acting in ways you would not normally (i.e. heightened sexual drive, reckless behaviour etc)?
- Have you found your self, or have others described you, talking more than usual and faster than usual?
- Have people commented on your mood, or energy, saying you seem more energetic than usual, or out of control?
- Have you been feeling more irritable than usual recently? Has there been a reason for this?
- Have you been feeling better about yourself recently?
- Have you felt that you are special in some way, or have special powers, or skills?

MANIA- SEVERITY RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Extreme
No observed, or reported elevation in mood. No change in self - opinion/ energy.		Cheerful without much reason. Unaccountable feelings of well-being that persist or Mild lability in mood Evidence of over-confidence with no real reason –within normal limits *&/OR* Some mild irritability	Reports excessive feelings of well-being, or cheerfulness without underlying reason Inappropriate to circumstances sometimes. More marked level of excitement. More prominent feels of self-importance. Overvalued ideas not delusional *&/OR* Moderate irritability	More persistent feelings of optimism, happiness, or elevated mood. Mood able to be shifted only with difficulty. Subject aware of inappropriateness of feelings. Behaviour may reflect the heightened mood. Clear cut grandiosity/belief in special powers - not all the time. More marked irritability evident/reported by others.	Mood elevated and inappropriat e most of the time. Some delusional beliefs about own powers/ abilities. Highly distractable/ loosening of associations. Interview difficult.	Subject reports feeling elated, euphoric, marked increase in energy, restlessness. Behaviour may be destructive-excessive spending of money/sexual activity etc. Delusional beliefs of grandiosity/ power. Easily distractable, interview very difficult. Subject obviously irritable.

***Onset date:…… Offset date*:……**

Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. *OR* several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use/stress noted	Occurs in relation to substance use/stress and at other times as well	Noted only in relation to substance use/stress

7.2 DEPRESSION

***NOTE**: Refer also to: Avolition, p.19; Anhedonia, p.20; Role Functioning, p.22; Suicidality, p.34*

- How would you describe your mood recently?

- Have you been feeling sad, or low? How often have you felt this way?

- Out of 10, what would be your average mood? Your lowest mood?

- Have you been able to enjoy activities, or feel good about yourself at all?

- How have you been feeling about the future (assess helplessness/hopelessness)?

- Has your interest in activities/events been lower than usual?

- Have you been able to complete, or start tasks you have been set (assess motivation)?

- How has your sleep been recently (assess change in sleep pattern/insomnia)?

- What has your appetite been like recently? Have you lost any weight?

- Have any events occurred recently that might account for these feelings (death/relationship issues/job/school)?

DEPRESSION- SEVERITY RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Extreme
No reported depressed mood. No physical signs of depression.		Some feelings of sadness. Does not dominate clinical picture. Able to distract self from depressive thoughts. Depressive themes not spontaneously volunteered.	Evidence of more sustained lowered mood. More difficult to shift mood. Lowered mood may be impacting on level of motivation, but not significantly interfering with role functioning. May be slightly tearful, or sad expression in interview.	Stronger observational evidence of lowered mood. Reduced ability to react to pleasurable events. More regular 'tearful episodes'.	Severe depression - mood not able to be shifted. No evidence of delusional component. Some suicidality, but not acted upon. Biological changes consistent with lowered mood evident (appetite/sleep disturbance). Very low energy.	Abject misery. Delusional component to mood – i.e nihilistic. More marked feelings of suicidality and associated behaviour.

***Onset date:…… Offset date*:……**

Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. OR several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use/stress noted	Occurs in relation to substance use/stress and at other times as well	Noted only in relation to substance use/stress

7.3 Suicidality and Self Harm

- Have you had any thoughts recently about harming, or killing yourself? How often have you felt this way?
- Have you had any thoughts of what you would do to achieve this?
- Have you acted on those thoughts at all? What happened?

Suicidality- Severity Rating Scale

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Extreme
Not present.		Occasional thoughts of being tired of living. Occasional thought of self harm. No suicidal thoughts, or plans.	Feeling of being better off dead. Suicidal thoughts, with only vague plan. Able to be distracted from thoughts with some effort. *OR* Minor actions of self harm (slight scratches etc).	Thoughts of suicide more frequent with associated plan. May be more seriously considering attempt with specific plan. **OR** Impulsive attempts using non-lethal method, or with knowledge of potential for being found.	Clear expression of wanting to kill self. **OR** Potentially serious, or lethal attempt with knowledge of possible rescue.	Specific plan and attempt. *OR* Serious attempt that clearly could have been fatal.

Onset date: …… ***Offset date*:**……

Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. *OR* several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use/stress noted	Occurs in relation to substance use/stress and at other times as well	Noted only in relation to substance use/stress

7.5 ANXIETY

- Have you been feeling nervous, or anxious recently? Has there been a reason for this? How often have you felt this way?
- How long does this feeling remain for?
- Have you felt panicky lately?
- Have you had times when you have felt breathless, heart racing, sweaty palms, tingling fingers, for no apparent reason?
- Do you have a phobia/are you afraid of dogs, spiders, enclosed places, crowds etc?
- Have you felt nervous around others recently (differentiate social anxiety from suspiciousness)?

ANXIETY- SEVERITY RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Extreme
No evidence, or reporting of anxiety.		Minor worries. Able to distract self from these. *&/OR* Mild physical signs of anxiety.	Moderate concerns, but level of anxiety is within appropriate range for event **&/OR** Moderate physical symptoms of anxiety.	Level of anxiety interfering slightly with normal activities. Some preoccupation with trigger. *&/OR* More marked physical signs.	More marked preoccupation with fears, sense of dread. *&/OR* Intrusive, distressing physical symptoms of anxiety	Level of anxiety disabling, feeling of panic, terrified.

Onset date:…… Offset date*:……*Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week **– more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily **– less** than an hour per occ.	Daily **– more** than an hour per occ. *OR* several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use/stress noted	Occurs in relation to substance use/stress and at other times as well	Noted only in relation to substance use/stress

SOCIAL AND OCCUPATIONAL FUNCTIONING ASSESSMENT SCALE (SOFAS).

Consider social and occupational functioning on a continuum from excellent functioning to grossly impaired functioning. Include impairments in functioning due to physical limitations, as well as due to mental impairments. to be counted, impairment must be a direct consequence of mental and physical health problems: the effects of lack of opportunity and other environmental limitations are not to be considered.

Code (Note: use intermediate codes when appropriate e.g., 45, 68, 72). RATING: _____

100 Superior functioning in a wide range of activities
|
91
90 Good functioning in all areas, occupational and socially effective
|
81

80 No more than a slight impairment in social, occupational, or school functioning (e.g.
| infrequent interpersonal conflict, temporarily falling behind in schoolwork).
71

70 Some difficulty in social, occupational or school functioning, but generally functioning
| well, has some meaningful interpersonal relationships
61

60 Moderate difficulty in social, occupational or school functioning (e.g. few friends, conflicts
| with peers, co-workers).
51

50 Serious impairment in social, occupational, or school functioning (e.g., no friends, unable
| to keep a job)
41

40 major impairment in several areas such as work or school, family relations (e.g. depressed
| man avoids friends, neglects family and is unable to work: child frequently beats up
31 younger children, is defiant at home, and is failing school)

30 Inability to function in almost all areas (e.g. stays in bed all say, no job, home or friends)
|
21

20 Occasionally fails to maintain minimal personal hygiene. Unable to function
| independently.
11

10 Persistent inability to maintain minimal personal hygiene. Unable to function without
| harming self or others without considerable external support (e.g. nursing care and
1 supervision)

Appendix C

Item	Item
1	Do places that you know sometimes seem strange, confusing, threatening or unreal to you?
2	Have you heard unusual sounds like banging, clicking, hissing, clapping or ringing in your ears?
2a	**Have you heard things that other people don't hear?**
3	Do things that you see appear different from the way they usually do (brighter or duller, larger or in some other way)?
4	Have you had experiences involving mind reading, ghosts, or predicting the future?
5	Have you felt that you're not in control of your own ideas or thoughts?
5a	**Do you sometimes feel as though another person or force is interfering with your thoughts?**
6	Do you have difficulty getting your point across, because you ramble or go off the track a lot whe
7	Do you feel that you are more talented or gifted than other people?
8	Do you feel that other people are watching you or talking about you?
8a	**Eg. When you're walking down the street or are on a bus and you hear people talking, do you t about you?**
9	Do you sometimes get strange feelings on or beneath your skin, like bugs crawling?
10	Do you sometimes feel suddenly distracted by distant sounds that you're not normally aware of?
11	Do you find that you're not interested in talking or getting together with your friends?
11a	**Have you been more withdrawn than usual from other people?**
12	Have you had the sense that some person or force is around you, even though you could not see
13	Do you ever feel that people might be intending to harm you?
14	Do you worry at times that something may be wrong with your mind?
14a	**Do you worry at times that you may be losing your mind?**
15	Have you ever felt as though you don't exist, the world doesn't exist or you're dead?
16	Do you sometimes wonder if an experience you've had is real or not?
17	Do you believe strange things that other people would find unusual or strange?
18	Do you feel that parts of your body have changed in some way, or that parts of your body are wo
18a	**Do you feel that parts of your body have changed in a way that you can't explain?**
19	Do you ever think of yourself as a famous or particularly important person?
20	Are your thoughts sometimes so strong that you can almost hear them?
20a	**Do you ever hear your thoughts out loud?**
21	Do you find yourself mistrustful or suspicious of other people?
21a	**More than you usually do?**
22	Have you seen things like flashes, flames, blinding light or geometric figures?
23	Have you seen things that other people can't or don't seem to see?
24	Do people sometimes find it hard to understand what you're saying?
25	Do you find it difficult to handle your responsibilities, like work, study or chores?

Appendix D

PQ

Prodromal Questionnaire

By Rachel Loewy, Adrian Raine and Tyrone Cannon. ©University of California, Los Angeles

ID: _____

Age: _____

Date: _____

May 2002

This questionnaire asks a number of questions about your thoughts, feelings, and experiences. Please read each item carefully and indicate whether you agree or disagree with it by circling true or false in the right-hand margin next to that item. Please try to answer each question.

I am easily distracted by noises or other people talking.	True	False
The passage of time feels unnaturally faster or slower than usual.	True	False
I often have difficulty organizing my thoughts or finding the right words.	True	False
When I look at a person, or look at myself in a mirror, I have seen the face change right before my eyes.	True	False
I sometimes get strange feelings on or just beneath my skin, like bugs crawling.	True	False
I do not get along well with people at school or at work.	True	False
Familiar surroundings sometimes seem strange, confusing, threatening or unreal.	True	False
I often seem to live through events exactly as they happened before (deja vu).	True	False
I sometimes smell or taste things that other people can't smell or taste.	True	False
I have difficulty concentrating, listening or reading.	True	False
I have had troubles at school or work recently.	True	False
Sometimes I think that people can read my mind.	True	False
I have heard things other people can't hear like voices of people whispering or talking.	True	False
I can't express my feelings as well as I used to.	True	False
I have interests that other people find odd.	True	False
I have lost a sense of who I am.	True	False
I am less interested than I used to be in keeping clean or dressing well.	True	False
18. I often hear unusual sounds like banging, clicking, hissing, clapping or ringing in my ears.	True	False
19. I often mistake shadows for people or noises for voices.	True	False
20. Things that I see appear different from the way they usually do (brighter, duller, larger, smaller, or changed in some other way).	True	False
21. I tend to be very quiet and keep in the background on social occasions.	True	False
22. People sometimes stare at me because of my odd appearance.	True	False
23. I wander off the topic or ramble on too much when I am speaking.	True	False
24. I believe in telepathy, psychic forces, or fortune-telling.	True	False
25. I often feel that others have it in for me.	True	False
26. My sense of smell sometimes becomes unusually strong.	True	False
27. Sometimes I have felt that I'm not in control of my own ideas or thoughts.	True	False
28. I have been feeling unhappy or depressed lately.	True	False
29. Everyday things affect me more than they used to.	True	False
30. I believe that I am especially important or have abilities that are out of	True	False

31. the ordinary.
32. Other people think that I am a little strange. True False
33. Sometimes my thoughts seem to be broadcast out loud so that other True False
34. people know what I am thinking.
35. I often feel that I have nothing to say or very little to say. True False
36. I am unusually sensitive to noise. True False
37. I am superstitious. True False
38. I have heard my own thoughts as if they were outside of my head. True False
39. I have trouble focusing on one thought at a time. True False
40. I often feel that other people are watching me or talking about me. True False
41. I get very nervous when I have to make polite conversation. True False
42. People comment on my unusual mannerisms and habits. True False
43. I am less interested in school or work lately. True False
44. I find it hard to be emotionally close to other people. True False
45. I tend to avoid social activities with other people. True False
46. I feel very guilty. True False
47. I am an odd, unusual person. True False
48. I sometimes feel that things I see on television or read in the newspaper True False
49. have a special meaning for me.
50. My moods are highly changeable and unstable. True False
51. I have been unable to enjoy things that I used to enjoy . True False
52. My thinking feels confused, muddled, or disturbed in some way. True False
53. Sometimes I feel suddenly distracted by distant sounds that I am not True False
54. normally aware of.
55. Recently, I have begun talking to myself. True False
56. I have had the sense that some person or force is around me, even True False
57. though I could not see anyone.
58. I am in danger of failing out of school, or have been fired from my job. True False
59. I have some eccentric (odd) habits. True False
60. At times I worry that something may be wrong with my mind. True False
61. I have felt that I don't exist, the world does not exist, or that I am dead. True False
62. I have been confused at times whether something I experienced was True False
63. real or imaginary.
64. People find me aloof and distant. True False
65. I tend to keep my feelings to myself. True False
66. I have experienced unusual bodily sensations (tingling, pulling, pressure, True False
67. aches, burning, cold, numbness, shooting pains, vibrations or electricity).
68. I hold beliefs that other people would find unusual or bizarre. True False
69. People say that my ideas are strange or illogical. True False
70. I feel worthless. True False

71. I feel that parts of my body have changed in some way, or that parts of True False
72. my body are working differently than before.
73. My thoughts are sometimes so strong that I can almost hear them. True False
74. I am not very good at returning social courtesies and gestures. True False
75. I sometimes see special meanings in advertisements, shop windows, or True False
76. in the way things are arranged around me.
77. I often pick up hidden threats or put-downs directed at me in what people True False
78. say or do.
79. I sometimes use words in unusual ways. True False
80. I am often angry, easily irritated or offended. True False
81. I have felt like I am looking at myself as in a movie, or that I am a True False
82. spectator in my own life.

83. I am less able to do usual activities or tasks. True False
84. I have not been sleeping well lately. True False
85. At times I have felt that some person or force interferes with my thinking True False
86. or puts thoughts into my head.
87. I have had experiences with the supernatural, astrology, seeing the True False
88. future or UFOs.
89. Some people drop hints about me or say things with a double meaning. True False
90. I am often concerned that my closest friends, classmates, or co-workers True False
91. are not really loyal or trustworthy.
92. I have little interest in getting to know other people. True False
93. I have seen unusual things like flashes, flames, blinding light, or True False
geometric figures.
94. I get extremely anxious when meeting people for the first time. True False
95. I have felt like I am at a distance from myself, as if I am outside my own True False
96. body or that a part of my body did not belong to me.
97. I find that when something sad happens, I am no longer able to feel True False
98. sadness, or when something joyful happens, I can no longer feel happy.
99. I cry often. True False
100. I have seen things that other people apparently can't see. True False
101. I feel unable to carry out everyday tasks because of fatigue or lack of True False
102. motivation.
103. Everyday things are more stressful than before, like school or work, True False
104. social situations, deadlines or changes in a schedule.
105. I often avoid going to places where there will be many people because True False
106. I will get anxious.
107. I have felt more nervous or anxious lately, and find it hard to relax. True False
108. I feel uninterested in the things I used to enjoy. True False
109. People often find it hard to understand what I am saying. True False
110. I have trouble remembering things. True False
111. People say that I seem "spacey" or "out of it". True False

1: POSITIVE SYMPTOMS

1.1 DISORDERS OF THOUGHT CONTENT

Delusional Mood and Perplexity ('Non Crystallized Ideas')

- Have you had the feeling that something odd is going on that you can't explain? What is it like?
- Do you feel puzzled by anything? Do familiar surroundings feel strange?
- Do you feel that you have changed in some way?
- Do you feel that others, or the world, have changed in some way?

Non-Bizarre Ideas ('Crystallized Ideas')

- Ideas of Reference: Have you felt that things that were happening around you had a special meaning, or that people were trying to give you messages? What is it like? How did it start?
- Suspiciousness, Persecutory Ideas: Has anybody been giving you a hard time or trying to hurt you? Do you feel like people have been talking about you, laughing at you, or watching you? What is it like? How do you know this?
- Grandiose Ideas: Have you been feeling that you are especially important in some way, or that you have powers to do things that other people can't do?
- Somatic Ideas: Have you had the feeling that something odd is going on with your body that you can't explain? What is it like? Do you feel that your body has changed in some way, or that there is a problem with your body shape?
- Ideas of Guilt: Do you feel you deserve punishment for anything you have done wrong?
- Nihilistic Ideas: Have you ever felt that you, or a part of you, did not exist, or was dead? Do you ever feel that the world does not exist?
- Jealous Ideas: Are you a jealous person? Do you worry about relationships that your spouse/girlfriend/boyfriend has with other people?
- Religious Ideas: Are you very religious? Have you had any religious experiences?
- Erotomanic Ideas: Is anyone in love with you? Who? How do you know this? Do you return his/her feelings?

Bizarre Ideas ('Crystallized Ideas')

- *Made thoughts, feelings, impulses: Have you felt that someone, or something, outside yourself has been controlling your thoughts, feelings, actions or urges?*

Have you had feelings or impulses that don't seem to come from yourself?

- Somatic Passivity: Do you get any strange sensations in your body? Do you know what causes them? Could it be due to other people or forces outside yourself?
- *Thought Insertion: Have you felt that ideas or thought that are not your own have been put into your head? How do you know they are not your own? Where do they come from?*
- *Thought Withdrawal: Have you ever felt that ideas or thought are being taken out of your head? How does that happen?*
- *Thought Broadcasting: Are your thoughts broadcast so that other people know what you are thinking?*
- *Thoughts Being Read: Can other people read your mind?*

DISORDERS OF THOUGHT CONTENT- GLOBAL RATING SCALE

0 Never, absent	1 Questionable	2 Mild	3 Moderate	4 Moderately severe	5 Severe	6 Psychotic and Severe
No disorders of thought content.	Mild elaboration of conventional beliefs as held by a proportion of the population	Vague sense that something is different, or not quite right with the world, a sense that things have changed but not able to be clearly articulated. Subject not concerned/ worried about this experience.	A feeling of perplexity. A stronger sense of uncertainty regarding thoughts than 2. *OR* Odd or unusual thoughts but whose content is not entirely implausible- may be some logical evidence. More evidence than rating of 4. Content of thoughts not original i.e. jealousy, mild paranoia.	Unusual thoughts, which can be easily dismissed. Clearly idiosyncratic beliefs, which although 'possible' have arisen without logical evidence. Less evidence than rating of 3 (eg referential ideas that certain events, objects or people have a particular and unusual significance.)	Unusual thoughts about which there is some doubt (not held with delusional conviction), or which the subject does not believe all the time. May result in some change in behaviour, but minor.	Unusual thoughts containing original and highly improbable material held with delusional conviction (no doubt). May have marked impact on behaviour.

***Onset date:…… Offset date*:**……

Frequency and Duration

0	1	2	3	4	5	6
Absent	Less than once a month	Once a month to twice a week **– less** than one hour per occasion	Once a month to twice a week – **more** than one hour per occasion **OR** 3 to 6 times a week - **less** than one hour per occasion	3 to 6 times a week - **more** than an hour per occasion **OR** daily – **less** than an hour per occ.	Daily – **more** than an hour per occ. *OR* several times a day	Continuous

Pattern of Symptoms

0	1	2
No relation to substance use/stress noted	Occurs in relation to substance use/stress and at other times as well	Noted only in relation to substance use/stress

Appendix E

Appendix F

Table 1. Age at start

	True Negatives	False Positives	ARMS	Psychotic	TN vs ARMS	FP vs ARMS	PSY vs ARMS
	Mean (s.d.)				P		
Bullied	10.5 (3.3)	9.3 (3)	9.1 (2.6)	10.2 (2.8)	.19	.72	.19
Physical abuse	7.6 (2.4)	7 (2.7)	6.5 (2.7)	6.7 (2.9)	.19	.49	.88
Witnessing family violence	7.6 (3.1)	7.2 (3.5)	6.4 (3.6)	6.4 (3.7)	.32	.31	1.0
Separation	11.4 (4.6)	10.4 (4.5)	9.7 (5)	9.6 (5.0)	.26	.48	.92
In care	11.2 (5.5)	12.3 (4)	9.4 (5.2)	9.5 (4.4)	.41	**.02**	.96
Sexual abuse	9.3 (1.5)	10.4 (3.4)	10.6 (3.6)	9.3 (2.8)	.57	.91	.39
Illness, injury or assault	9.5 (4)	11 (4.4)	9.5 (5.0)	11.4 (4.1)	.82	.26	.27

Table 2. Childhood Adversity (Months)

	True Negative Vs ARMS		False Positives vs ARMS		Psychotic vs ARMS		ARMS
	Mean (sd)	T (101 df)	Mean (sd)	T (172 df)	Mean (sd)	T (67 df)	Mean (sd)
Bullied	25.7 (34.8)	1.4	20.6 (34.2)	.70 (275)	25.9 (41.2)	-1.09	17 (28.0)
Physical abuse	41.5 (50.5)	-.22	46.3 (46.9)	.35 (275)	46.1 (47.6)	-.21	44(45.1)
Witnessing family violence	49.5 (57.3)	1.8	40.4 (76.4)	.77 (275)	25.7 (32.6)	.65	31 (36.5)
Separation	25 (34.3)	.13	27.2 (38.5)	.50(275)	26.9 (30.6)	-.33	24 (34.6)
In care	10 (26.7)	-.78	11.7 (26.2)	-.63(275)	10.1 (19.5)	.63	15 (31.3)
Sexual abuse	1 (3.7)	-1.0	4.5 (15.2)	.77 (275)	6 (17.1)	-.99	3 (11.5)

Table 3. Discrimination

	True Negative Vs ARMS		False Positives vs ARMS		Psychotic vs ARMS		ARMS
	% (N)	χ^2(df)	% (N)	χ^2(df)	% (N)	χ^2(1df)	% (N)
Discrimination							
None	85 (50)		66 (154)		48 (12)		66 (29)
Verbal	9 (5)	(2) 5.53	16 (38)	(2).33	16 (4)	(2) 2.40	14 (6)
Verbal and Physical	7 (4)		18 (41)		36 (9)		21 (9)
Child	12 (7)	(2) 5.06	15 (35)	(2)4.3	12 (3)	**(2) 9.70****	25 (11)
Teenager	4 (2)		18 (44)		40 (10)		9 (4)

Table 4. Current influence of substances

	True Negative Vs ARMS		False Positives vs ARMS		Psychotic vs ARMS		ARMS
	% (N)	(1df) χ^2	% (N)	(1df)χ^2	% (N)	(1df) χ^2	% (N)
Methadone or Subutex	7 (4)	.19	14 (32)	.71	16 (4)	.74	9 (4)
Librium	5 (3)	.02	6 (15)	.23	8 (2)	.35	5 (2)